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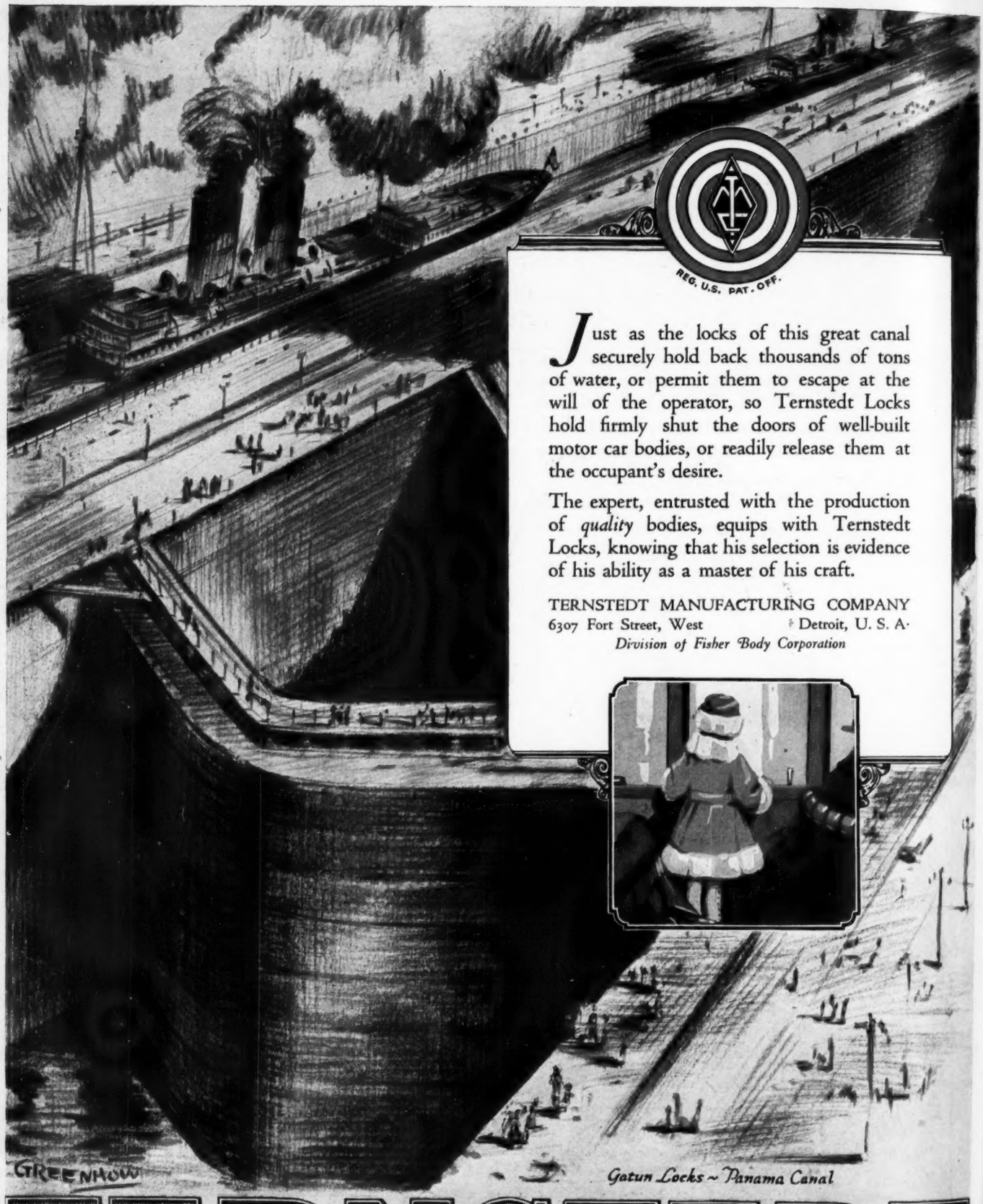

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VOL. XLIX NEW YORK—THURSDAY, NOVEMBER 15, 1923 No. 20

Basis Found for Coordination of Highway Transport

Report of committee headed by A. H. Swayne defines economic fields for motor vehicles. Conclusions real tribute to vision of automotive industry

By James Dalton

THE report of the special committee appointed by the Chamber of Commerce of the United States to consider the relation of highways and motor transport to other transportation agencies, together with the conclusions, based upon the thorough and scientific investigation which was made, form a highly important chapter in the history of the automotive industry. They mark the dawn of a new era of understanding and cooperation, with the automotive industry holding out the olive branch of peace to the railroads. The report, which is published practically in full on the pages which follow, should be read and studied by every man engaged in the manufacture or sale of automotive products.

FORMAL recognition of the fact that motor vehicles are entitled to a distinct and important place in the broad field of transportation has been given by a committee of traffic experts who have studied diligently all phases of the situation for more than eight months.

This committee, headed by Alfred H. Swayne, vice-president of the General Motors Corp., included in its membership prominent representatives of steam and electric railroads, waterways and the public. It was aided in its efforts by distinguished economists and statisticians. The painstaking survey it made was unbiased and impartial. It had access to sources of information hitherto unavailable and it had only one object—to determine the facts.

The findings of the committee constitute a striking tribute to the broad-mindedness, clear vision and public spirit of the leaders of the automotive industry, for they constitute, in large measure, merely a reiteration of the principles adopted by the industry over a period of years as part of its platform. One of the most striking of all is the fact that these platform planks, recognizing the rights of other means of transport, were adopted at a time when the older forms of transportation were denouncing the motor vehicle as impractical, unfair, and its competition unjust. Conscious of rectitude, seeking only a square deal, and admitting economic evils which had sprung up, the automotive industry contended that it was the public interest alone which ultimately would shape the course of transportation history.

IT is this view which has been accepted by the special committee appointed last March by Julius Barnes, president of the Chamber of Commerce of the United States, to study the relations of highways and motor transport to other transportation agencies.

The report, which is presented herewith practically in full, is worthy of the serious study of every person engaged in the manufacture or sale of automotive

These Are the Men Who Surveyed Economics of Highway Transport

ALFRED H. SWAYNE, *Chairman,* Vice-President, General Motors Corporation, New York.

W. J. L. BANHAM, General Traffic Manager, Otis Elevator Company, New York.

L. W. CHILDRESS, President, Columbia Terminals Company, St. Louis.

D. C. FENNER, Engineer and Manager, Public Works Department, Mack Trucks, Inc., New York.

GERRIT FORT, Vice-President, Boston and Maine Railroad Company, Boston.

PHILIP H. GADSDEN, Vice-President, United Gas Improvement Company, Philadelphia.

W. H. LYFORD, Vice-President and General Counsel, Chicago & Eastern Illinois Railway Company, Chicago.

RALPH H. MATTHIESSEN, President, Motor Haulage Company, New York.

JOHN D. MILLER, President, National Milk Producers' Federation, New York.

H. H. RAYMOND, President, Clyde Steamship Company, New York.

ARTHUR T. WATERFALL, Vice-President, Dodge Brothers, Detroit.

HENRY J. WATERS, Editor, Weekly Kansas *Star,* Kansas City.

ROBERT C. WRIGHT, General Traffic Manager, Pennsylvania Railroad System, Philadelphia.

products. It outlines simply and clearly the fields in which highway transport can give the greatest economic service, how this service can best be provided, and how it should be regulated to insure regularity and fair competition.

The committee worked in an atmosphere which was wholly amicable, in a spirit of give and take, with a determination to think only of the greatest good to the greatest number. Its members have given freely of their time and they have performed a distinct public service.

In its issue of Jan. 18, 1923, AUTOMOTIVE INDUSTRIES said:

"The bitter antagonism toward motor vehicles so long manifested by the railroads has no economic justification. There are no inherent obstacles to cooperative effort. Development of the country has been retarded by a lack of adequate transportation and full advantage must be taken of every means available. * * * If agreement can be reached on the main points involved, and agreement does not seem far distant, there are no insuperable differences which cannot be overcome if representatives of the railroads and the automotive industry will get together around a conference table."

This was written before President Barnes had set up his Transportation Conference after an historic meeting in New York, and the prediction has been vindicated by subsequent developments. Eight months have brought a profound change in sentiment. Misunderstandings have been wiped out and examination of the facts has disclosed that there is no economic need for conflict. Representatives of other forms of transportation have expressed on more than one occasion their admiration for the public spirited attitude of the automotive industry. It seemed scarcely possible last January that so much could be done in so short a time.

Other committees appointed by President Barnes at the same time will report on other phases of the coordination of transportation. These reports also have been completed. When they are assembled they will form the groundwork for constructive action which can carry into effect the carefully formulated recommendations.

The next step will be the calling at Washington of a vitally important transportation conference to consider the entire question of transportation upon which so much of the nation's prosperity rests. By whom it will be called has not been determined, nor has the date been fixed. The sessions will be held, however, soon after the incoming Congress begins its work. The scientific analysis which has been made should do much to counteract half-baked socialistic theories and the demand for Government ownership or operation of the railroads.

When this conference has completed its deliberations, however, the work will scarcely have been begun, for no matter how logical the findings which may be reached they cannot be carried into effect without the consent of the great mass of the shippers of the country who constitute the Court of Last Resort.

Widespread use of the motor truck for store-door collection and delivery, the most important proposal made by the Swayne committee, involves a change in shipping habits which will be revolutionary in its results. Shippers must be convinced of the economic advantages of this system before they will consent to its adoption. This process of education will be slow and laborious.

The message of coordination of transportation for the good of all must be preached eloquently and persistently. It must be carried into every corner of the country. In this constructive effort the automotive industry should play a leading part. There will be work for the humblest dealer as well as the biggest manufacturer. A platform has been found upon which all can stand and they should stand shoulder to shoulder to fight a good fight.

The report of the Swayne committee, the most important contribution ever made to the literature of highway transport, follows:

Motor Vehicle's Economic Value Has Been Proved

A NEW facility in transportation—one which is destined to play a large part in our completed transportation system, of which the railroads must always remain the backbone—has arisen and rapidly grown to large proportions. This facility is the motor vehicle.

Inevitably this rapid growth of a new transportation facility has had its effect on the old facilities. Inevitably there has been, and still is, misunderstanding and conflict in the fields of the old and new facilities, and the old ones are only at the beginning of a readjustment of their activities, to meet the new conditions. Meanwhile the new facility, with inadequate organizaton and often with little knowledge of its own operating costs, has, in some cases, attempted to handle traffic for which it is not fitted, thus producing an incorrect popular impression

(*Continued on page* 986)

How Motor Vehicles Should Be Coordinated with Other Transportation Agencies

As a result of its study the committee has reached the following conclusions:

1. The best interests of the public and the rail, water and motor carriers lie in cooperation between the various agencies of transportation rather than in wasteful competition.

2. The greatest opportunity for cooperation is at the points where the capacity of the railroads is most limited and expansion is most difficult and costly; that is, in the terminal areas of our great cities.

3. Store-door delivery by motor truck, which would relieve congestion in these terminal areas and greatly increase the capacity of the freight stations, is undoubtedly the greatest contribution which can be made to the solution of the terminal problem.

4. Organized motor transport can also relieve the railroads of various forms of uneconomical service, such as trap-car service, switching between local stations and short-haul shipments within the terminal area. This will reduce yard congestion and release many cars for more profitable line haul.

5. To secure the fullest benefit from this organized motor transport will require the utilization and further development of modern technical equipment, such as demountable bodies, trailers and semi-trailers, containers and container cars, and mechanical handling appliances.

6. Outside of the terminal areas there are distance zones, varying in different localities and for different commodities, in which one type of carrier, the motor for short haul and the railway (or waterway) for long haul, is clearly more economical than the other, and intermediate zones in which competition is inevitable. The motor vehicle also has a wide field where there is no other agency available. Motor trucks and buses should be used to supplement the facilities of existing common carriers.

7. It is to the public interest, as well as to the interest of the respective carriers, that the economic limitations of each type of carrier be recognized, that the railroads be permitted to discontinue unprofitable service to which the motor is better suited, and that the motor abandon its efforts to handle general traffic over excessive distances. However, because of the public interest which affects the operation of railroads, they have performed and must continue to perform some service which is unprofitable, chiefly in territory where the performance of highway transportation would also be unprofitable. If the railroads are to be deprived of a substantial share of their more remunerative traffic through unfair and, to the trader, uneconomical methods, the traffic remaining to the railroads must take on an added burden in the form of higher rates or impaired service. In all cases where the railroad can handle traffic with greater or equal efficiency, all factors being considered, the public interest requires that it be allowed to do so. Unprofitable steam railroad service can in some cases be successfully replaced by the use of self-propelled railroad motor cars.

8. To insure to the public continuity and reliability of service, sound financial organization of motor transport is necessary, as well as public regulation of common-carrier motor service.

9. Passenger bus transport should be so regulated as to secure the best service to the public, certificates of public convenience and necessity as already required in many States being a useful means of insuring reliable and continuous service. Rail lines can often advantageously extend or supplement their service by bus lines, and in States where this is now prohibited such restrictions should be abolished.

10. Regulation of traffic and of size, weight and speed of motor vehicles by States and municipalities having control should be made more uniform within States and as between States. Regulation of common-carrier operations of motor vehicles, including rate regulation, should be handled by the federal or State authorities, under the commissions which now control the operations of rail and water carriers.

11. Trunk highways in any area should be able to carry the normal vehicular traffic of that area, and, if the traffic economically justifies the use of especially heavy trucks, highways with stronger subbases must be provided. This constitutes a problem requiring particular attention in the design of highway systems and in the regulation of traffic. In other respects present types of highways, present routes connecting principal centers of population and production, and the present trend in size, weight and speed restrictions of vehicles using highways show a rational system of highway development that should be continued.

12. Investigations now under way by the U. S. Bureau of Public Roads, State highway departments and other agencies to determine more fully the economic role of the motor vehicle should be continued.

as to its proper rôle in our national transportation system.

There is already evidence of a tendency toward better understanding of this rôle and toward increasing cooperation of the motor with all other carriers. This report points out ways to further and make effective this cooperation.

The motor vehicle has proved its unquestionable value in our economic system. It has greatly extended the farmer's field of operation, bringing much additional land under cultivation. It has brought new sources of raw materials within economic reach of markets. It has quickened the industrial life and facilitated the processes of distribution. All these influences have contributed to our national prosperity but have thrown an enormous new tonnage upon our rail carriers.

The congestion of transportation today centers around the terminals of our great cities, and it is at these terminals that the railroads find the greatest difficulty in keeping pace with the public need. With hardly an exception, the main tracks of our railroads have sufficient capacity for the movement of more freight than can be offered to them. Still, in spite of this fact, the railroads are constantly faced with a demand for more and better terminal facilities in the face of prohibitive real-estate values and other stupendous obstacles to expansion. Here lies the greatest opportunity for the motor truck. By the use of motor transport the facilities of the terminals can be so expanded as greatly to increase their capacity.

Both within and outside the terminal areas motor transport, to be of its utmost value to the public, needs two things—sound organization and wise regulation. Sound organization, which implies accurate understanding of costs, methods and the economic limitations of motor service, will do much to insure dependability of service. But in the public interest, and in fairness to all carriers, there must in addition be proper regulation and an equitable system of taxation.

Trucks Help Railroads Within Terminal Areas

IN the terminal areas of our great cities, with their enormous concentration of population, our transportation system must perform four functions: (1) distribution of commodities, including food, clothing and other necessities, to the local population; (2) receipt and forwarding of goods in general commerce; (3) delivery of raw products to and collection of finished products from industries, and (4) interchange of freight between railroads (or between railroads and ships and barges). There is also the problem of the daily suburban passenger movement.

To fulfill their functions the railroads have had to build, all in or near the terminal area, yards for breaking up and making up trains, auxiliary yards for local switching, freight houses for receiving and delivering less-than-carload (l. c. l.) freight, team tracks for receiving and delivering carload freight, interchange tracks and belt lines for transfer of cars, and a variety of special facilities to handle particular commodities. To meet the public demand and the competition of other railroads, they have built into the heart of the city as far as possible, frequently establishing many local stations in one terminal area.

The operations of the railroad in such a terminal area are complex and costly. It is the delays here that limit the capacity of the railroad as a transportation facility.

Two general classes of freight are moved by the railroad—carload and less than carload (l. c. l.). The two differ in three particulars:

1. Carload freight is loaded into and unloaded from freight cars by the trader or the trucker whom he employs, while l. c. l. freight is loaded and unloaded by the railroad employees.

2. Carload freight does not pass through a freight station but is loaded and unloaded at the trader's expense on public team tracks or private tracks of industries. L. c. l. freight is loaded and unloaded over a station platform at the expense of the carrier. In most instances these freight stations are located on high priced property in the congested areas of large cities.

3. L. c. l. rates are higher than carload rates because l. c. l. cars are seldom, if ever, loaded to anything like their tonnage capacity with this character of freight, and because of the heavy station expense incident to its handling.

L.c.l. Freight Remains Too Long in Cars

The prevailing practice is to notify the consignee of the arrival of l. c. l. freight after it has been unloaded in the freight house, or the cars containing carload freight have been placed on the team or industry tracks. The railroads give the consignee an allowance of 48 hours free time for the loading and unloading of carload freight and for the removal of l. c. l. freight from the freight stations. Partly because of unorganized cartage methods and inadequate storage facilities and partly because many goods are sold after arrival at the terminal, a large proportion of the consignees take full advantage of the free time allowance, so that carload shipments on the average remain on the team tracks in excess of two days and inbound l. c. l. shipments remain in the freight houses an average of three days.

Failure to load and unload cars promptly at industries and team tracks ties up a large amount of the railroad equipment that could otherwise be moving freight. Failure to remove the l. c. l. freight from the freight houses often results in such congestion that the equipment is held up, and moreover causes a piling up of goods in the freight houses, with great resultant delay and confusion in locating and removing shipments, and a general slowing down of the entire freight-house operation. The tendency of shippers to dump their outbound goods upon the freight house at the last moment produces the same effect. This in turn increases cartage inefficiency and costs by delaying the trader's vehicles.

Other Wasteful Use of Cars

Another practice involving wasteful use of cars and contributing to congestion is that of industries that have sidings loading l. c. l. freight into "trap cars." Such cars, generally loaded to only a small part of their capacity, have to be switched to a transfer platform in the break-up yard or elsewhere, where the freight has to be rehandled by the railroad and consolidated into cars for the line haul. The railroads themselves also make a similar use of cars for interchange of l. c. l. freight, and in some cities for movement between local freight houses and general assembly and distribution stations.

The general demand for more and better rail transportation is insistent, and the railroads are confronted by a serious dilemma. They must either add to their present terminal facilities or find a way to pass more freight through them. Enlargement or multiplication of terminal stations and team tracks in important terminal areas is practically impossible because of prohibitive cost, objection of municipalities to the expansion of railroad holdings in congested areas, and furthermore the

additional traffic congestion that would result from greater centralization of cartage operations in such areas.

There are three principal directions in which the motor truck can serve to relieve the terminal situation:

1. By organized cartage instead of the present go-as-you-please methods of receipt and delivery at the rail terminal; further than this, by store-door delivery, which is the real completed transportation.

2. By substitution of motor service for a part of the rail service. This would cover trap car l. c. l. freight service to industries and, in large measure, similar movement in interchange and between local stations.

3. By complete elimination of certain rail service. This would cover intraterminal movement, such as movement between industries or different plants of the same industry within the terminal area, which would then be handled by motor truck.

Store-Door Delivery Greatly Needed

A well-organized system of store-door delivery by motor truck would be perhaps the greatest contribution to the solution of the terminal problem.

In organizing such a system, two objects, not only desirable but fundamental, must constantly be borne in mind:

First.—Better service to the trader, without increased cost;

Second.—Economy to the carriers, this object being of vital importance because of its bearing on any future rate reductions.

At a large city, where the terminals are complicated, inbound l. c. l. freight should be delivered to the address of the consignee and outbound l. c. l. freight should be collected from the consignor by the cartage organization at a reasonable charge plus the freight rate, and in full cooperation with all rail and water carriers serving that city. Regarding the routing of freight over the various lines, some arrangement would have to be made for a fair and equitable distribution of the traffic so as to give the best service. Such a plan would involve cooperation by the cartage organizations, the carriers and the traders and would produce the following results:

1. Inbound l. c. l. freight would be delivered promptly upon arrival. It should be arranged to dispatch the bulk of the inbound traffic from the stations as is done at English and Canadian freight stations. The delays arising under the present system of notifying consignee and holding goods until called for could thus be avoided.

2. The rail haul could begin or end at an outlying station, readily accessible to highway vehicles, thus avoiding the delay and expense of moving cars or freight through the terminal to some l. c. l. freight station in the congested district. It is clear that so long as the freight is collected or delivered at the door of the trader, shipper or consignee, it does not matter to him at what point it is transferred from rail to truck or from truck to rail.

3. The railroads would be relieved of the necessity of maintaining expensive l. c. l. freight stations in the heart of the busy, and generally congested, business districts.

4. Street congestion would be reduced.

5. Shipments moving between large cities could be consolidated into fewer cars, thereby avoiding transfers and increasing the average lading of merchandise cars.

Careful consideration of these results will be convincing as to the tremendous benefits to be gained by the organization of a system of store-door delivery; but it is only fair to state that there will be objections from the traders and from the railroads, because of concessions which will be required from each.

At every city of importance, some railroads have decided advantages over others, in location and facilities, for the handling of l. c. l. traffic, and a serious objection to relinquishing such advantages will be offered by those railroad managers who do not realize that, under present methods, they are carrying l. c. l. freight to and from such cities at an actual loss.

Alfred H. Swayne

Because of the great number of people engaged in transportation, store-door service, although simple in operation, would have to be put into effect gradually, in order to educate the shipping public as well as the transportation employees and to avoid confusion:

(a) By the organization of a company or companies adequately equipped to perform the service;

(b) By helpful action on the part of the railroads to encourage the utilization of this complete system of transportation; and

(c) By cooperation of the traders in giving this service a full and fair trial.

Store-door delivery of carload freight would be limited to that which is delivered on public team tracks for industries which have no track connections, or at pier stations. Very effective arguments can be made in favor of store-door delivery of team track freight. It is therefore recommended that store-door delivery of team track carload traffic be included in the arrangements from the outset.

Railroad companies are organized for transportation and not for storage. In this country the railroads are furnishing storage in cars and stations for an enormous volume of freight, and most of the storage is free of charge to the trader.

Public warehouses should be established at or near each industrial center within a terminal area, and when a trader is not prepared to accept his freight on arrival it should be carted to the warehouse nearest his industry

and stored at his expense to await his convenience. Also it should be definitely arranged that where goods are delivered to a trader's store door and acceptance is refused, the cartage cost in both directions will be charged to him.

Under the prevailing system of miscellaneous cartage which, with very few exceptions, is in use in all terminal areas in the United States, each trader sends to the terminal station his own or a hired vehicle to deliver or receive his particular freight. As a consequence, the streets leading to the terminal station are burdened with innumerable trucks and wagons containing only partial loads. The greater number of these vehicles are drawn by horses and contribute to the congestion far more than would the same number of motor trucks.

The substitution of an organized trucking system for the miscellaneous haphazard service now employed for station work would greatly increase the load efficiency of vehicles, thus reducing the number on the streets. It would speed up street traffic and reduce the danger to pedestrians.

Another distinct advantage which would follow from the establishment of organized collection and delivery would be the shifting of the loading and unloading of a large proportion of the freight cars from the present terminal freight stations and team tracks, in the most congested parts of the terminal area, to locations outside of the congested districts and on cheaper ground. Because, under present conditions of unorganized cartage, the trader is obliged to furnish his own cartage, he naturally wants to have his freight accepted or delivered at the station or team track which is nearest to his industry. At such new location, adequate stations and team tracks could be furnished.

Interchange of Freight in Cars Delays Traffic

Notwithstanding the fact that, as rail terminals are now operated, the existing terminal facilities and car supply are admittedly inadequate for the accommodation of the traffic requirements, the railroads, at nearly all terminal centers, are using freight cars for the interchange of l. c. l. freight. The use of cars for this service not only seriously delays the traffic, but the practice adds to the congestion of the terminals. At one large terminal center three days is the average time consumed in such interstation movement; while at another, such movement is handled by automotive equipment, with the result that 95 per cent of the freight so moved is delivered to the forwarding line on the same day it is unloaded from cars by the receiving line.

In some cases, railroads have built substations outside of the congested district. At such substations l. c. l. freight is concentrated, unloaded and rehandled for distribution in cars to various stations, of which some are their own stations located in the business section and others are the stations of connecting lines. It has been proved, by several years of successful experience in Cincinnati and St. Louis, that instead of reloading this freight in cars, it should be handled by automotive equipment, to afford relief to the terminals and release cars for more profitable service. Unquestionably prohibition of the use of cars for this character of service would increase car supply and the capacity of existing terminals.

The substitution of motor trucks for freight cars in interchange and substation service would be accomplished most efficiently and economically by embracing this service within the scope of the activities of the organization which would furnish store-door collection and delivery.

What has been said regarding the use of freight cars in interchange and substation service would apply with equal force to "trap car" service to industries.

This service is one of the special privileges of the large trader, and is recognized by the railroads as unprofitable. Its discontinuance has often been proposed by them, not only because of its unprofitableness and its effect of increasing terminal congestion, but also because it gives to the trader who enjoys the private side track what is equivalent to free store-door collection of l. c. l. freight—an advantage not enjoyed by the traders having no direct rail connections.

A legal remedy for this practice lies with the Interstate Commerce Commission, which, in the public interest, should require the railroads either to discontinue performing service of this character or to charge for it rates commensurate with its cost.

Truck for Intraterminal Movements

There is another class of intraterminal movements, namely, the local movement of freight between different industries or different plants of the same industry within the terminal area and between terminal cities and their suburbs.

All such short movements of freight should be made by motor truck, which would be quicker and less expensive than by rail and would release for line haul a very large number of box cars.

The best available information indicates that such short movements of freight by rail are performed at an actual loss to the railroads, as the rates which they are allowed to charge are wholly inadequate to cover the expenses properly chargeable to this service over their most expensive property.

It is recommended that all such short movements of freight be handled exclusively by trucks and that the railroads cancel their tariffs covering them and exclude such traffic from their stations. Already the trucks are handling a large volume of this traffic, for which they are furnishing a store-door service, and they are making deliveries within a few hours as compared with several days required by the railroads to perform only part of the transportation. In any event, the trucks must move the freight to the receiving stations and remove it from the delivering stations; they might better carry it all the way.

Semi-Trailers Cut Idle Time Costs

Freedom of movement of freight through a terminal station requires that during the time occupied in unloading inbound cars there shall always be an available cartage vehicle at the station platform to receive the freight from the trucker who removes it from the car, and that during the time occupied in loading outbound cars there shall always be an available freight car to which the freight may be trucked directly from the cartage vehicle. This is the most effective way in which the station platform can be kept free from accumulations of freight. The cartage organization must supply a sufficient number of vehicles to receive the inbound freight as fast as it is unloaded, and often these vehicles must be kept standing at the station platform for many hours. Such necessary delays make the use of ordinary motor trucks unprofitable for this service.

In Cincinnati, demountable truck bodies, and in St. Louis, semi-trailers, are used in transferring freight be-

tween stations. Each of them is much less expensive than a motor truck in first cost and maintenance, and no operating expenses are incurred while the body or trailer is standing idle.

It is not the function of this Committee to pass upon the merits of these special plans or of any others proposed for particular localities. Traffic conditions vary so widely in different cities, due to length of haul, street congestion, width of streets, shippers' facilities for receiving and shipping freight, etc., that the selection of the type or types of equipment required in any locality could be wisely determined only after thorough investigation in that particular place.

The charges for organized cartage should be borne by the traders as they are now, but should be less than the present cost of unorganized cartage and still should be sufficient to produce fair profits for the cartage organization, and should be covered by separate tariff rates. Such rates should be uniform within certain zones in the terminal area.

Unit containers, which, as the name implies, are individual boxes which can be loaded and sealed by the shipper, transported to the consignee on truck chassis, freight car, vessel or all three, without disturbing the contents, offer great possibilities in the coordination of all transportation facilities.

Motor Vehicle Efficient for Making Short Hauls

THE use of motor vehicles outside the terminal area falls into two general classes—that over highways where there is no other alternative (except horse-drawn vehicles) and that where the service might be performed wholly or in part by steam or electric railroads or by waterways. In the former class the horse and motor service is obviously supplementary to the rail or water carriers. In the latter class a basic question at once arises as to whether the relative fields of the different forms of transportation can be positively defined or whether there is a zone in which competition between them is inevitable.

Study leads to the belief that there is such a zone, flanked on one side by an area of long haul which should belong primarily to the steam and electric railroads and the waterways, and on the other by the short-haul zone in which, as has already been stated, motor transport should play a larger part. The economic limits of the zones vary greatly according to the commodities and the local conditions. Where good highways exist it appears that for distances up to 10 miles in some instances and to 25 miles in others the motor truck has the advantage over the steam or electric railroad, and that beyond 50 miles under certain conditions and 150 miles in others the railroad should generally have the field. This leaves a competitive zone with a lower limit of 10 to 25 miles and an upper limit ranging from 50 to 150 miles, and more in special cases. Within this zone each form of transportation has its advantages to the shipper, who should be free to make his choice with due regard to cost, time of transit, reliability of service and other considerations.

Freight Movements Developed by Few Electric Lines

Primarily the question as between the steam railroad and the motor vehicle arises with respect to freight movement; as between the electric railroad and the motor vehicle, with respect to passenger movement. Freight movement has been highly developed by a relatively small number of electric railroads, however, notably in the Middle West and in California, and there is wide opportunity for further development of such service. Also, the steam, as well as the electric railroads, have a problem in competition of motor buses with their accommodation and branchline passenger trains.

It is not believed that there are many cases where competition arises as between waterways and motor vehicles.

The extent to which railroads could profitably abandon their short haul l. c. l. service depends so much on the character of their traffic and upon local conditions that every case must be considered separately. In general, the zone in which the railroads might profitably turn over local hauling to the motor truck may have a radius of 25 miles in some regions and as low as 10 miles in others.

Truck's Influence on Railroad Embargoes

The influence of railroad embargoes and congestion is marked. The latest figures available from the Connecticut survey indicate that the recent improvement in the rail service has brought about a definite reduction in the average length of haul of commodities by motor truck.

The motor vehicle industry presents a good illustration of the effect of embargoes and congestion. It is forced to move large quantities of raw materials long distances by motor truck to its factories in order to maintain steady serial production, and in turn to distribute many of its finished vehicles under their own power—the movement in each direction being considerably more expensive than it would be by rail if cars were available. Last year 700,000 motor cars and trucks were sent out from the factories under their own power.

A considerable percentage of our present-day trucking is handled by tramp operators who have little knowledge of the actual cost of this service. They engage in cutthroat competition and the short lives of the majority of the companies is an indication that their rates are in general below cost.

While the comparative charges for the completed movement of the commodity are a basic factor in determining which transportation agency will get the business, there are other important elements. These include the time of transit, reliability of service, and responsibility for loss and damage.

Factors Which Affect Truck Haulage

In all cases the varying kinds of commodities to be handled, the packing requirements, the question of comparative rail and water rates and facilities, the continuity of service, the type and grade of the highway available, and other purely local conditions will enter into the problem.

So long as a considerable part of motor transport is left in the hands of operators who know little of cost accounting, and so make and break rates every day and are forced out of business when their trucks wear out, the service will remain undependable and the public will be unable to realize the full possibilities of motor transport, even though it may derive temporary benefit from charges below cost. The railroads, on the other hand, will not be able to withdraw from unprofitable service and save a large expense due to unnecessary stations and station personnel until the public is assured of reliable and continuous truck service.

To establish motor haulage on a sound basis and determine more definitely its economic range, the service must be organized and backed

by responsible capital. Such capital will demand full knowledge of all of the elements of the cost of operation.

And if common-carrier trucks are permanently to form a part of our national transportation scheme, common-carrier regulation is vitally necessary.

It is evident that if the motor vehicle is to supplant the steam or electric railroad in good weather, it must supply the service throughout the entire year and over definite routes at stated times. This indicates that the motor vehicle performing the service should secure a certificate of convenience and necessity from the duly constituted public authority and should be required to give continuous service. It also naturally implies that the state or local government must remove snow and otherwise maintain the highways in passable condition at all times as part of the highway maintenance.

The requirement of continuous service can obviously be applied only to the common-carrier motor vehicle. It is not feasible or desirable to interfere with the trader's right either to move his goods on his own trucks or to contract with private truck operators.

There are many branch-line railroads of very light traffic. They may carry a heavy summer traffic to and from pleasure resorts, which can be handled profitably by motor vehicles, or there may not be enough traffic any time in the year to interest motor carriers. In either case service by rail some or all the year is well-nigh indispensable to the communities along the lines, and the railroads may be forced to operate them at a continuous loss, or, in case the lines are abandoned, as is taking place to some extent, the communities suffer hardship.

The gasoline or other self-propelled railroad motor car probably offers the railroad the best opportunity to eliminate or curtail its losses on these lines of light traffic. The gasoline car can be operated from 25 to 50 per cent lower than the cost of operation of steam units, the lower capital expenditure, cheaper fuel requirements and lesser labor charges all being in favor of the independent operation and making possible greater frequency of service.

Gasoline Units Practicable for Railways

Much progress has been made toward rendering the gasoline unit mechanically practicable for railroad service, and a growing number of railroads are making use of the vehicle for short distances, although the field does not afford an opportunity for any very large scale development. Thus far the tendency has been to employ this equipment to cut down losses on non-profitable lines, but instances of use for interurban service on main lines indicate a field for profitable operations for selected forms of service. Each installation, however, will require an examination into local needs, existing facilities and other varying factors.

The self-propelled vehicle does not fully meet the situation at this time with respect to branch line operation, as it does not provide for the movement of low grade commodities, such as coal, nor is it adaptable to train use because of its lighter construction.

Thus far consideration has been given chiefly to the respective fields of the steam railroads and the motor vehicle. The movement of freight by the steam railroads far overshadows that by the electric railroads, the estimated ton mileage of the electric railroads in 1922 being approximately one billion, as compared with 340 billion for the steam railroads. No reliable estimate is available as to the ton mileage by motor truck, but it is believed that it far exceeds that by electric railroad. In certain sections, however, the electric railroad has become an important factor in the rapid movement of high class freight. In Ohio, Indiana and Michigan, notably, the electric railroads give a fast through service for distances up to 400 or 500 miles. There they interchange cars with steam railroads and have published tariffs for through service.

In many localities the electric railroads are hampered in the handling of freight by the fact that their tracks are in the public streets and highways, where both the sharp curves and the traffic restrictions tend to limit or prohibit freight movement. The newer interurban lines, however, have been built largely on private right-of-way with easy grades and curves and substantial roadbed. Freight houses, team tracks and industrial sidings have been provided comparable to those furnished by steam railroads. In some metropolitan centers, where it was not feasible to establish freight terminals in the heart of the city, outlying terminals have been established with motor truck collection and delivery service.

Electric Railways Widen Competitive Zone

Because of the greater flexibility of the electric car as compared with the steam train, and the lower overhead due to the smaller investment in terminals, the electric railroad can in many instances handle package freight profitably for distances below the economic limit for steam railroads, thus widening the competitive zone as between the electric railroads and the motor truck.

The possibilities in the use of electric railroads in the handling of freight have not as yet been fully appreciated, even by electric railroad companies themselves, and a large development of this field may be expected in the future.

Surveys made by the Bureau of Public Roads show that in the days of wagon hauls they averaged 9 miles, thus indicating that there was a sharply restricted economic zone on either side of the rail lines; whereas with the development of the motor vehicle its greater flexibility and cruising capacity have greatly widened the zone. The farmers have, furthermore, been enabled to take their goods to more favorable markets. Replies of 215 farmers in the Corn Belt, responding to inquiries from the Department of Agriculture, show that, while the average distance from the old market was 6.9 miles, many have changed to new markets with an average distance of 17.6 miles. According to the Joint Commission of Agricultural Inquiry, the estimated cost for hauling in wagons from farms to shipping points averaged in 1918 about 30c per ton mile for wheat, 33c for corn, and 48c for cotton, while the averages for hauling in motor trucks or by tractors were 15c for wheat and corn and 18c for cotton.

The economic range of truck farming around metropolitan districts has also been greatly increased by the motor truck. Land within the radius of the horse-drawn vehicle has been released for residential development, the truck farmer moving to less valuable land farther from the city.

Economies of Moving Farm Products

Studies have been undertaken by the Bureau of Agricultural Economics in cooperation with the Bureau of Public Roads to analyze the movement of typical commodities such as fruit, milk, grain, live stock and cotton

in various parts of the country. It is the intent to obtain accurate information as to relative costs, time, availability of service and other considerations, to determine under what circumstances it is more profitable to truck the farm products to the nearest railroad station and ship them by rail, and under what circumstances it is more economical to truck them the entire distance to the point of distribution.

Problems similar in their main aspects are involved in industrial movement, which may cover manufactured goods, high valued goods, lumber, coal and petroleum. The Bureau of Public Roads is soliciting information as to such movements from operators in the New England district, and is planning to institute similar studies elsewhere in cooperation with the state highway departments. The National Automobile Chamber of Commerce is undertaking analyses of special long-distance movements rendered seemingly imperative by shortage of railroads facilities.

The results of some of these studies may be available within three months. Others will conceivably extend a year or two years into the future. The importance of this research is urged, and it is earnestly hoped that it will be completed.

Uniform Common Carrier Regulations Are Needed

IN previous sections of this report the need for suitable regulation of motor carriers has been brought out. There remains to be considered the character of this regulation.

Motor vehicles are subjected to two general but distinct uses:

(1) Private use by their owners for the transportation of persons or property.

(2) Transportation for hire of the persons or property of others than their owners.

The second general use is subdivided into two definite and particular classes; that is, motor vehicles operating for hire are employed to carry certain persons or the property of certain persons to places prescribed in individual agreements entered into for the purpose, or they are employed to carry indiscriminately all persons or the property of all persons under general conditions of agreement applicable to the whole public. In a word, the use of motor vehicles for hire can be divided into that of private carriers and common carriers.

From the standpoint of public interest, the common-carrier motor bus and truck must be considered in the light of their relation to other common carriers.

Channels of Government Regulation

Governmental regulation of motor-vehicle operations on the highways run in three different and distinct channels: (1) Regulation of the common-carrier business which to an ever increasing degree is being taken up by the motor vehicles; (2) regulation of the physical characteristics, such as size, weight and equipment of all motor vehicles, and (3) regulation of traffic.

Governmental regulation may be exercised by the federal, state or municipal governments. Federal control is obviously confined to regulation of interstate commerce. The state has jurisdiction over intrastate commerce and in addition has police power over physical characteristics of vehicles and regulation of traffic. The municipality also has more or less complete police power over traffic, and in addition, in some cases, depending upon the municipal charter, general state laws or state constitution, may have power over common-carrier operations within its limits.

There has been a growing recognition during the past few years of the principle that one engaged in the business of common-carrier by motor vehicles should be subject to regulation as to its rates or service just as any other common carrier.

Unregulated competition of motor-bus lines with electric railroads, or of several bus lines with each other, may temporarily give increased service or lower rates, but inevitably it will result in decreased earnings and a lowering of the standards of service, until one or all of the competitors are faced with ruin. Under proper regulation, intelligently and fairly applied, such as has been adopted in a number of states, the extent to which competition is desirable in the public interest rests with the regulatory body. Destructive rate cutting is prevented, and duly authorized motor-vehicle common carriers are accorded the same protection given to other public utilities, this at the same time providing the greatest measure of useful service to the public. Through judicious regulation, and only in this way, will it be possible to obtain efficient, economical and adequate coordination of motor transport and electric or steam railroads.

Federal regulation of interstate common-carrier motor transportation has not as yet been adopted, but it is believed that it is necessary.

Municipal regulation of common-carrier motor service frequently interferes with the effectiveness of this form of transportation, particularly where such municipal regulation conflicts with regulation by the state.

The principle of regulation by state regulatory bodies of intrastate traffic has been quite generally accepted in this country, and is believed to be sound as applied to motor vehicle common carriers as well as to other public utilities.

Commission's Regulatory Powers Vary

The scope of the regulatory powers of the utility commissions varies widely in the several states. The following outline covers broadly the powers which have been vested in these commissions, for the purpose of public supervision of common carriers:

(a) Power to grant, refuse to grant, supplement and amend the right to operate.

(b) Determination of the amount upon which, in fairness and justice to both the investor and the public, the enterprise should be allowed to earn a return.

(c) Establishment of rates or systems of rates which will yield sufficient revenue to meet all operating and overhead charges, including a reasonable rate of return to the investor.

(d) Power of regulation in respect to all matters affecting conditions and character of service, including extensions and improvements.

The right to operate common-carrier motor vehicles, similar as that to operate an electric railroad or other public utility, should be contingent upon the granting of a certificate of public convenience and necessity. In considering an application for such a certificate, the state commission should take into account, as the commissions now do in the states where the motor vehicle is under their jurisdiction, the extent and quality of service rendered by the existing agencies, the desirability of introducing new competition or forcing existing agencies to curtail or discontinue their operations—in short, the public interest in the premises.

If a certificate is granted, the operator should be compelled to furnish ample evidence of financial responsibility or else carry insurance adequate to cover all injuries to persons or damage to property resulting from negligent operation.

Where motor transport particularly by passenger buses appears to answer the public need most fully, it is believed that other forms of common carriers should be permitted to install such service as an adjunct to their lines. They are now prevented by the laws of some states, and it is believed that such laws should be repealed.

The enormous development of the motor vehicle, during the past ten years, not only in numbers but also in size and weight, has introduced a number of very perplexing problems with respect to the construction and maintenance of highways and the supervision of traffic on the highways. The increased wear on highways due to the increasing use of heavier and faster vehicles has resulted in the adoption by most of the states of size, weight and speed restrictions.

At the present time there is no uniformity in these restrictions, and this results in serious inconvenience and hardship on individuals and companies operating in more than one state. The weight restrictions in some states are rather indefinite, some specifying gross weight of vehicle and load, enumerating maximum permissible weight on four wheels and six wheels and stating distance between axles, while other states in addition to the above, restrict the maximum load per inch of tire. It is believed that there should be uniform size, weight and speed restrictions in all states and municipalities, provided that, where conditions demand, seasonal restrictions, lower than those normally enforced, should be prescribed and administered, under proper safeguards, by the state authority.

Buses Are Useful Media for Passenger Transport

THE competition of the motor vehicle with the steam and electric railroads for passenger traffic divides primarily into two classes—that carried by buses and that of the private automobile. Whatever inroads the private automobile has made upon the carriers are inevitable and the carriers must adapt themselves to the new conditions.

Bus service may be classified as (1) tourist service, (2) de luxe service in urban districts, (3) noncompeting service, (4) feeder service to rail carriers and (5) parallel competitive service.

The first and second classes depend upon the willingness of the public to pay a higher rate for a more agreeable form of transportation. The first class is exemplified by the development on the Pacific Coast, where by combinations of routes it is possible to travel from Portland to San Diego on lines operated on schedules with published tariffs. The traffic is so heavy on some of these lines that space must be booked a week ahead.

The second class is illustrated by the operation of the Fifth Avenue Coach Company in New York City, where a 10c fare is willingly paid for a slower ride than on the 5c subways a few blocks away. Taxicabs also come in this category.

The third class, which embraces the independent lines that connect communities not connected by rail, or traverse urban and suburban sections without rail transit, renders a necessary service to the public, and feeds into, rather than draws business from, the rail lines.

There is no sharp dividing line between the third and fourth classes, but the latter is intended to cover only the lines built for the definite purpose of connecting with and extending the service of railroads (or waterways). Such lines may be independently operated, but the electric railroads themselves, and to a lesser extent the steam railroads, are establishing bus lines as feeders.

There can be little question as to the desirability of free play in the development of motor service for any of these four classes.

The fifth class, where the motor bus offers a service parallel and practically identical in quality with the electric (or steam) railroad, offers a more serious problem. Questions to be answered here are: Is the service of the rail carrier adequate and satisfactory to the public? If not, can the rail carrier make it so?

In some fifteen states the public service commission already has authority to grant or refuse to grant certificates of public convenience and necessity to such prospective motor operators. It is wise for the commissions to have this authority, as it will afford the existing railroads adequate protection.

Standards for Judging Merits of Transportation

The standards by which the merits of any medium of passenger transportation must be judged are:

1. **Ability to render safe, adequate and satisfactory service in an efficient manner under all prevailing conditions.**
2. **Cost of the service.**

There is now quite general agreement on the part of public officials and transportation experts in the automotive and electric railroads fields who have studied the problem that the two forms of passenger transit—motor vehicle and electric railroad—cannot permanently exist in a community and pay their way in competition with each other. Furthermore, there exists today an almost unanimous opinion among those who are qualified to judge that the motor vehicle may be used to supplement the electric railroad service in such a manner that the transportation needs of the community will be most efficiently met by the provision of a complete system of transportation, under the supervision of a single reliable agency, rather than by individual transportation units.

The problem must be analyzed from the standpoint of the requirements of the entire community. There may be instances where buses, operating in competition with steam and electric railroads, have so flourished as to give rise to the feeling that the new medium was the more economical unit. That condition arises primarily because the bus most frequently operates over what may be termed "preferred routes," where the traffic density is greatest and the length of haul shortest, but without regard to the needs of the community as a whole.

Substituting Buses for Trolleys

On the other hand, nearly every large urban electric railroad company has lines which are implicitly unprepared to operate. They may reflect bad judgment on the part of an earlier management, or shifting population that has taken away traffic they once had, or they may have been built under public compulsion. In any event, the companies have heretofore been compelled to continue to operate these lines, with a resultant drain upon the revenues from their more remunerative lines and a lessening of their ability to render adequate service to the entire community.

It seems reasonable that in such a case the railroad

company should be permitted to substitute bus for rail operation, or that if an independent bus company be granted a certificate of convenience and necessity to operate a parallel service substantially similar in quality, the railroad company should be permitted to abandon the unprofitable rail line.

It is believed that the electric railroad is the best medium for the mass transportation of passengers, and should be the foundation of the coordinated transit system of the whole community.

It is, however, recommended that a thorough study be made of the problems involved in the handling of the transportation of passengers within the terminal areas, with special reference to public and private passenger carrying vehicles.

Motor Traffic Brings New Highway Problems

THE modern development of our national system of improved roads dates from the development of the passenger automobile. The passenger automobile has dictated the roads to be built first, and will perhaps in the main continue to do so. The motor truck, which is virtually a development of the last five years, has had little effect on the selection of roads to be built.

The railroads of our country have been built to connect the most important centers. The highways connecting the same centers have naturally been improved first, and consequently parallel the railroads to a large extent.

Factual studies made by the Bureau of Public Roads show that at least 75 per cent of the traffic on all main highways is purely local in character and that it tends to become constant for the full length of the highway. In other words, even where it parallels a rail or water carrier, the highway extends the field of influence of that carrier, giving it, through the motor vehicle, a new means of collection and delivery with an increased radius of operation.

The efforts of highway promotional associations to stimulate road development by concentrating public attention upon long-distance highways has undoubtedly led to an impression that transcontinental needs have been given undue consideration. A survey of actual road development, however, will show that highway engineering practice is and has been directed toward caring first for local traffic, and that interstate highways, of which there are now a number, grow naturally as local roads are linked together.

The enormous increase in motor traffic in the past five years has brought with it new problems for the highway engineer. The motor truck did not find its place as a unit in national transportation until the war, and as it was during that period and the one immediately following that highway engineers were forced to cut down maintenance, it naturally followed that a question arose as to the ability of the engineer economically to maintain the road under the new traffic.

Effects of Trucking on Road Wear

The continued studies of the Bureau of Public Roads in the field of physical research have brought to light valuable facts on the effects of traffic upon road wear. For example, it is definitely known now that a so-called "heavy" truck may cause only a normal wear and tear to the surface of a road, where a "light" truck with an abnormal relation between sprung and unsprung weight, a heavy overload, or too narrow or worn tires may cause considerable damage. Research has further definitely shown that capillary action, incomplete drainage, frost and other weather effects are vital factors in highway costs.

The studies have demonstrated conclusively that no fair measure of traffic influence upon highway cost can be obtained unless all of these factors are given weight, as well as others, such as comparative density of traffic, speed of travel, weight per axle rather than gross load, and the comparative type of the highway and its condition.

It is evident, too, that as the daily volume of traffic increases, costs of maintenance become relatively high; hence the need for high-type surfaces in districts where there is a dense traffic of fast light-weight vehicles. It follows, therefore, that higher-type highways would be necessary to care for dense traffic even if there were no motor-truck influence exerted. It is equally true that the greater the maximum concentrated load on the highway, the greater the strength required to sustain the load, and to enable the engineer to design his highway properly there should be a maximum total weight restriction.

The effect of the increasing use of the motor truck on the design of the highway is mainly in making necessary a heavier subbase. For how much of this heavier design the motor truck is responsible and how much of it is attributable to the increase in motor traffic of all kinds, no scientific formula has thus far been developed. Consequently no fair method of assigning the additional costs of construction or maintenance has been devised. It is hoped that studies now contemplated by the Bureau of Public Roads will result in such a formula.

Obviously, the motor truck cannot be operated economically except where there are improved highways. If the motor truck is to occupy the field of short haul, therefore, the highways should be brought to such a point of efficiency and strength as to enable them to carry the legal maximum load. Suitable maintenance and snow removal in winter are equally essential.

Continued appropriation is urged for the development of our federal, state and local highway systems along wise and economic lines, and also for the extension of the highway research being conducted by the government agencies.

Mack A B Chassis Have New Radiator

MODEL A B Mack trucks and buses are now being fitted with a new fin and tube radiator incorporating a McCord core instead of the Mack ribbon cellular core formerly employed. In making this change the capacity of the cooling system has been increased from 3½ to 6¼ gal. Lower tank and side frames are now aluminum castings solidly braced, while the head tank is of 16 gage sheet brass well reinforced and flanged for bolting to lower section. This assembly is mounted on solid rubber blocks intended to absorb vibration and act as cushions tending to prevent distortion.

Construction is such as to facilitate cleaning of the tubes. The latter are supported by the fins, which are continuous from side to side of the radiator. Severe bumping tests are said to have proven that the new type is considerably more durable than that formerly employed.

Oil Lubricated Floating Cam Features Locomobile Front Wheel Brake

Forward pair is equalized and no unlocking occurs in rounding curves. Design is similar to Isotta type in most respects. Large wearing surfaces and well cooled drums help minimize wear and render frequent adjustment unnecessary. Skidding is reduced.

By Herbert Chase

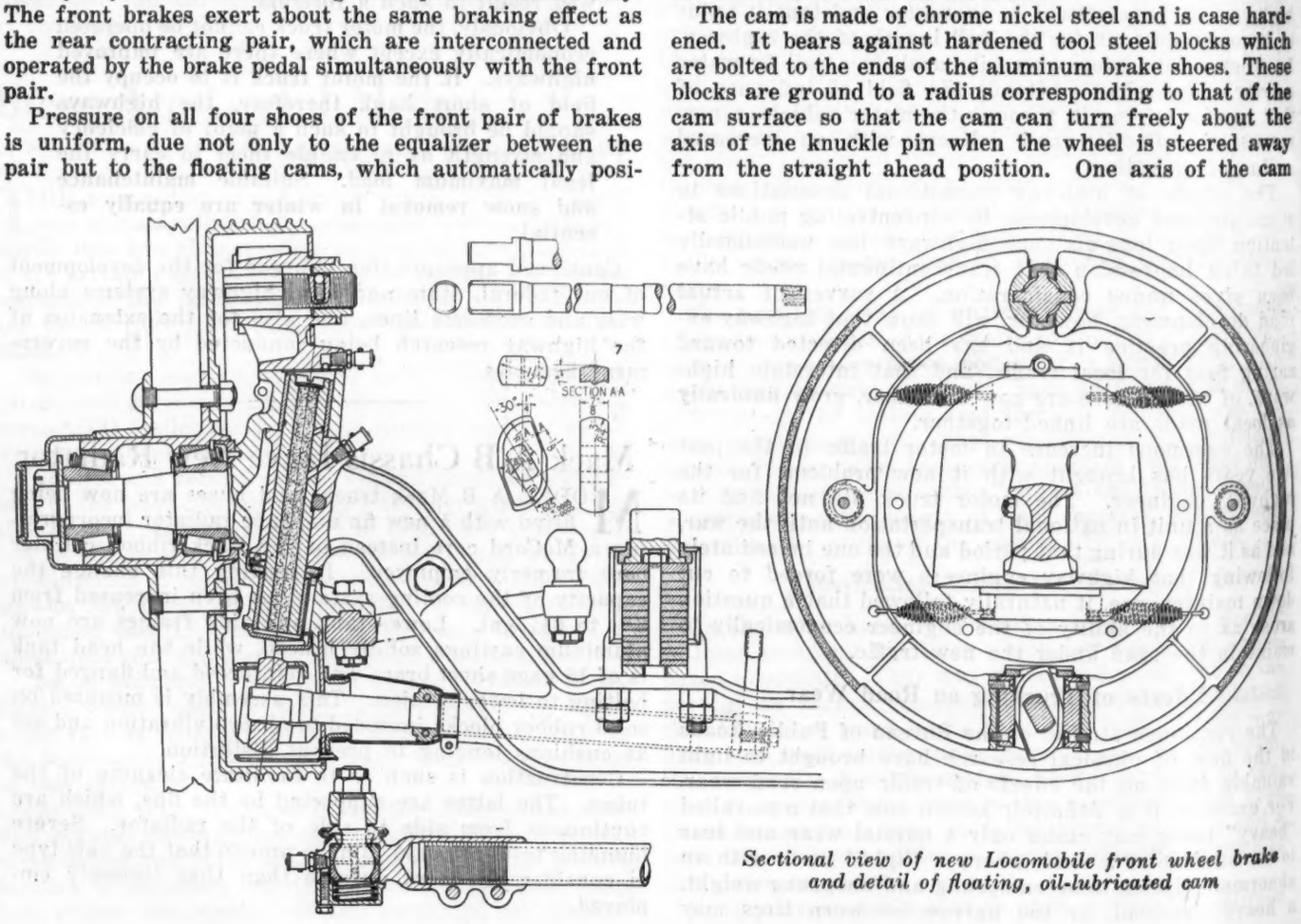
LOCOMOBILE'S new front wheel brake announced in our news columns last week is not greatly different in general design from other brakes with which our readers are familiar, but incorporates a number of refinements which are worthy of careful study. Of particular interest is the equalization of the front brakes as a pair, the design of the floating cam and the use of hardened bearing surfaces with adequate provision for lubrication.

Unlike most front wheel layouts, no provision for unlocking either front wheel brake when rounding a curve is made. It is the contention of Locomobile engineers that such a construction throws more pressure on the wheel which is still braked and is apt to cause it to lock. In the Locomobile, the brake linkage is so designed that it practically is impossible to lock either front or rear wheels on any dry surface when using foot-operated brakes only. The front brakes exert about the same braking effect as the rear contracting pair, which are interconnected and operated by the brake pedal simultaneously with the front pair.

Pressure on all four shoes of the front pair of brakes is uniform, due not only to the equalizer between the pair but to the floating cams, which automatically position themselves in such a way as to equalize the pressure on the shoe blocks against which they bear. The design of the cam surface is such as to give substantially the same pressure in all angular positions of the cam. Furthermore, there is said to be no interference with steering and no tendency to spread or contract the shoes when the wheels move about the knuckle pivots.

By examination of the cuts it will be seen that the cam is carried on a short shaft which is pressed into the axle center forging and is keyed to a C-shaped lever attached to a long pull rod. The outer end of this shaft is flattened to slide freely through an oblong hole in the cam. The latter is constrained to turn with the shaft but is free to move axially on the shaft and to rock and slide parallel to the flat surfaces, the hole in the cam being longer than the width of the flat on the shaft.

The cam is made of chrome nickel steel and is case hardened. It bears against hardened tool steel blocks which are bolted to the ends of the aluminum brake shoes. These blocks are ground to a radius corresponding to that of the cam surface so that the cam can turn freely about the axis of the knuckle pin when the wheel is steered away from the straight ahead position. One axis of the cam



Sectional view of new Locomobile front wheel brake and detail of floating, oil-lubricated cam

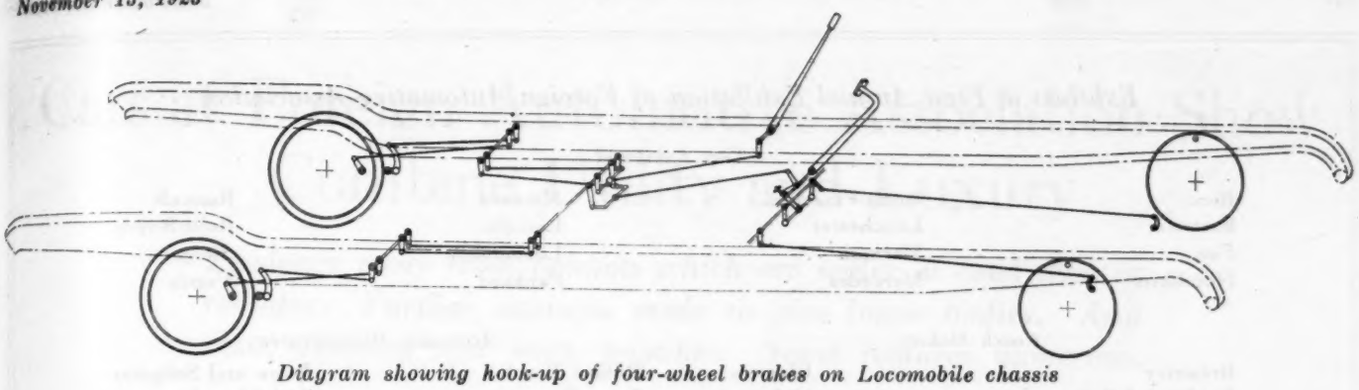


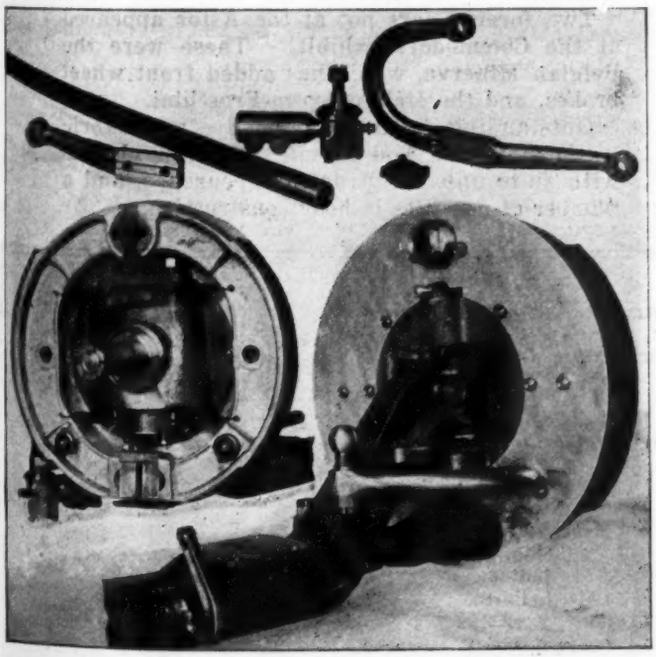
Diagram showing hook-up of four-wheel brakes on Locomobile chassis

lies, of course, in the axis of the knuckle pivot, which is inclined to give approximate center point steering.

The knuckle pivot axis, produced, meets the road about ¾ in. inside the central point of tire contact. This arrangement was chosen, it is claimed, because it was found that true center point steering is apt to cause hunting.

It will be noted, by reference to the drawing of the axle end, that the knuckle pivot pin is made hollow and is sealed at the top by a Hubbard plug. There are two oil reservoirs. That above the Hubbard plug carries lubricant for the upper bushing, while that inside the pin, which is stuffed with curled hair, is filled with oil through an Alemite connection. This oil rises slowly through the lower pivot bushing and thrust bearing and gradually overflows into a cupped washer, whence it drains slowly down onto the cam surface, which, it is claimed, is kept just moist with oil. Any surplus oil drips off into a small pan below the cam, whence it is drained and goes to waste.

Adjustment at the brake is made by turning a single nut on a stub shaft which forms the anchor pin. The outer end of this shaft has four taper splines, two of which bear in a bracket attached to the knuckle forging and prevent the shaft from turning, while the other two cause a split bushing to expand as the shaft is moved axially by tightening the nut, thus providing an adjustment for wear which is quickly and easily carried out. The nut is internally serrated and engages a spring pressed ball which clicks into the serrations as the nut is turned but locks it against accidental turning.



Views of the new Locomobile front axle, showing details of front wheel brake and other axle parts

A wing nut below the floor boards provides a quick adjustment between front and rear brakes, which are operated by pedal. The factory adjustment is such that the front brakes go on slightly ahead of the rear contracting pair, but each of the four create about the same retarding effect.

Rear wheel brakes remain as heretofore. The contracting pair contact with an outer drum, while the inner hand-operated pair expand against an inner drum. There are thus a total of six drums, four on rear and two on front wheels. The total braking area of the foot-operated brakes is given as 562 sq. in. This makes for long life and especially for comparatively low temperatures when the brakes are continuously applied on long descents.

All drums are well cooled and it is said to be practically impossible to heat the brakes to the high temperatures at which rapid wear is certain to occur. Front drums have circumferential ribs which are claimed to have, by actual test, considerably more heat radiating capacity than unribbed drums, as well as less tendency to go out of round with increase in temperature. Drums are machined from high carbon steel castings.

Arrangement of the brake operating mechanism is shown in an accompanying diagram. It will be seen that the brakes are all equalized in pairs, but that there is no equalization between the front and rear pair. An equalizer is omitted at this point because if the rod to any of the four should break, all four would be out of commission Instead of using solid brake rods, chrome nickel steel tubes are employed. Those in front are so long that motion due to spring action is negligible.

It was necessary, of course, to redesign the front axle to accommodate the front wheel brakes, but it was not found necessary to redesign the front springs except to the extent of adding an extra clip to prevent separation of the thin leaves at the forward end. The axle center, steering arms and knuckle forgings are made from steel having the following analysis: Carbon, 0.35; chromium, 0.60 to 0.90; nickel, 3.5 per cent. Ball forgings are the same analysis except that the carbon is lowered to 0.15. Tie rod is fitted with ball and socket ends.

In the process of developing the brakes here described the Locomobile engineers experimented with cars with various brake arrangements. Included in these tests were some made on wide asphalt streets which were wet down and even oiled to make them slippery, with a view to testing the effect of various brake arrangements on skidding when brakes were applied. According to Delmar G. Roose, chief engineer of the Locomobile Co., these tests showed that a car braked on the front wheels only showed much less tendency to skid when the brakes were applied suddenly at high speeds than a car similar in all respects except with brakes on rear wheels only. It is also stated that addition of front brakes has made the car safer to operate, particularly when it has to be run on long slippery grades.

Exhibits at First Annual Exhibition of Foreign Automotive Association

Cars Exhibited

Benz	Isotta-Fraschini	Minerva	Renault
Brewster	Lanchester	Lincoln	Rolls-Royce
Fiat	Marmon	Locomobile	Steiger
Hotchkiss	Mercedes	Panhard	Voisin

Coach Makers

Brewster	Clayton	Robert Bosch	Bowe and Seligman
Locke and Company	Holbrook	Para Tires	Radel Leather
Kellner	Rothschild	Wolf's Head Oil	

Ralph S. Roberts of Le Baron

Accessory Manufacturers

Novelties in Body and Chassis Design Appear at New York Salons

TWO New York Automobile Salons this year took the place of the single exhibit of high grade coach and chassis work held in previous years. The nineteenth annual Automobile Salon, held at the Hotel Commodore, Nov. 11-17, was preceded by the first annual exhibition of the Foreign Automotive Association, held at the Hotel Astor, Nov. 4-10.

The two shows were similar in general character, exhibits being confined to high priced vehicles and expensive body work in both cases. American and foreign cars appeared in both exhibitions. The latter predominated 11 to 5 at the Hotel Astor, while American makes were in a majority by 10 to 4 at the Commodore. The cars were exhibited by manufacturers or importers in some cases and by body builders in others. A number of novel features of chassis and body design were displayed.

A Locomobile chassis equipped with four-wheel brakes was on view at both of the exhibits, as was a novel Renault model constructed somewhat like the old hansom cab.

In the Foreign Automotive Association show, one job which attracted particular attention was a Brewster sedan with a folding back seat to permit the rear compartment to be converted for carrying a trunk. Other important exhibits include a Mercedes equipped with supercharger; the German Steiger, a newcomer to America; and a number of body construction details which are likely to be adapted to production cars at some future time.

AT the Automobile Salon, body builders played an important part, although nine manufacturers had space. Winton, Cunningham, and Duesenberg were the only American cars represented directly, but coachmakers displayed their wares on chassis of Packard, Peerless, Locomobile, Cadillac, Lincoln, and Marmon.

Two foreign cars not at the Astor appeared at the Commodore exhibit. These were the Belgian Minerva, which has added front wheel brakes, and the Italian Isotta-Fraschini.

Outstanding features included a new fabric leather Meritas body, some Franklin chassis with quite unusual frontal appearance, and a number of novelties in body construction.

Exhibits at Nineteenth Annual Automobile Salon

Cars Shown by Manufacturers or Importers

Cunningham	Isotta-Fraschini	Renault	Winton
Duesenberg	Minerva	Rolls-Royce	

Cars Exhibited by Coachmakers

Cadillac	Lincoln	Marmon	Peerless
	Locomobile	Packard	

Custom Coach Work Exhibitors

Brunn	Dietrich	Holbrook	Merrimac
Cunningham	Fleetwood	Judkins	Paul Ostruk
de Causse	Healey	LeBaron	Springfield

Accessory Exhibits

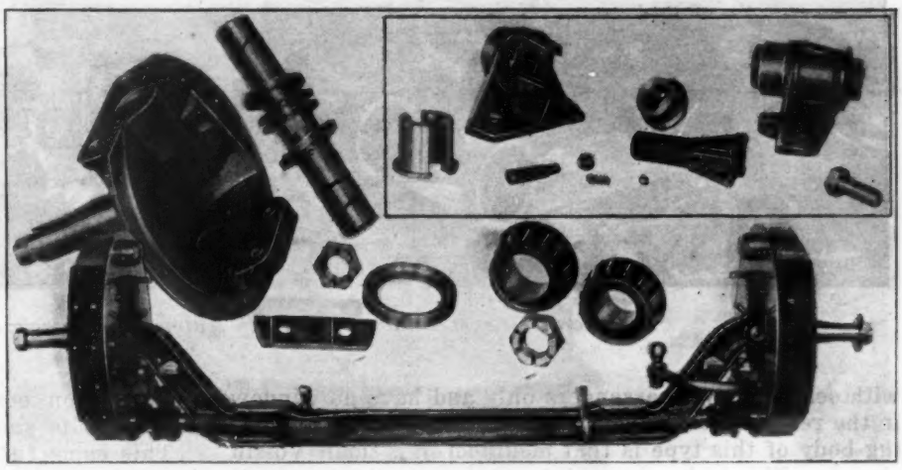
Sidney Blumenthal & Co.	Para Tire Company	Wefco Company
Grand Maison de Blanc	Vogue Tire Co.	Wm. Wiese & Co.

Cars at Foreign Automotive Association Show Combine Utility and Luxury

Tendency away from bonnets which are wider at cowl than at radiator. Further attempts made to give lower bodies. Arm rests, dividing rear seats, popular. Novel features numerous.

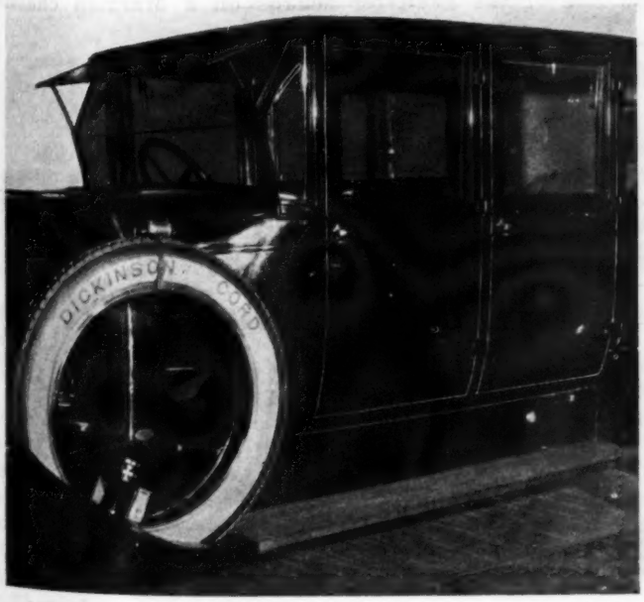
CUSTOM built bodies, though seldom used on chassis produced in large quantities, are still of considerable interest to large car and body producers, because they often set the style and contain refinements in design which frequently are applicable to quantity production in the same or in modified form. On this account much interest attaches to the bodies shown at the importers' salons in New York, where the product of both American and European coach builders are exhibited.

It can be said that there is in general no pronounced change in body lines, although there are the usual novelties to be seen in every show in which custom bodies are on exhibit. On large cars, in particular, there is some tendency to get away from bonnets which are considerably wider at the cowl than at the radiator, thus producing a more slender and graceful appearance than is obtained when the cowl line is carried straight forward.



Some detail views of the front axle of the Locomobile with front wheel brakes assembled upon it, this being one of the outstanding novelties of the Foreign Automotive Association's show. The cut shows the separate parts, such as the knuckle, knuckle pin, front wheel bearings, brakeshaft brackets, etc. The brakes are operated by cams which float on their respective shafts, to allow for the deflection of the brake drums with the knuckles in steering. The camshafts are supported by the front axle and there is consequently no need for universal joints

There is, of course, no sudden break between cowl and hood, but a pleasing double curve in the cowl itself before it joins the bonnet. Bodies shown on the Minerva, Lanchester, Hotchkiss and Panhard chassis exemplified this tendency. That on the Minerva, in particular, is striking, because the belt line is carried forward to the radiator on a raised portion of the bonnet in pleasing and sweeping curves, forming the outline of a narrow tongue which comes almost to a point at the radiator. This effect is shown clearly in an accompanying sketch. The tongue is in a color which contrasts with other parts of the bonnet and helps to accentuate the narrow effect.



Chupurdy body on Panhard chassis. Note V-shape windshield and rapidly narrowing cowl

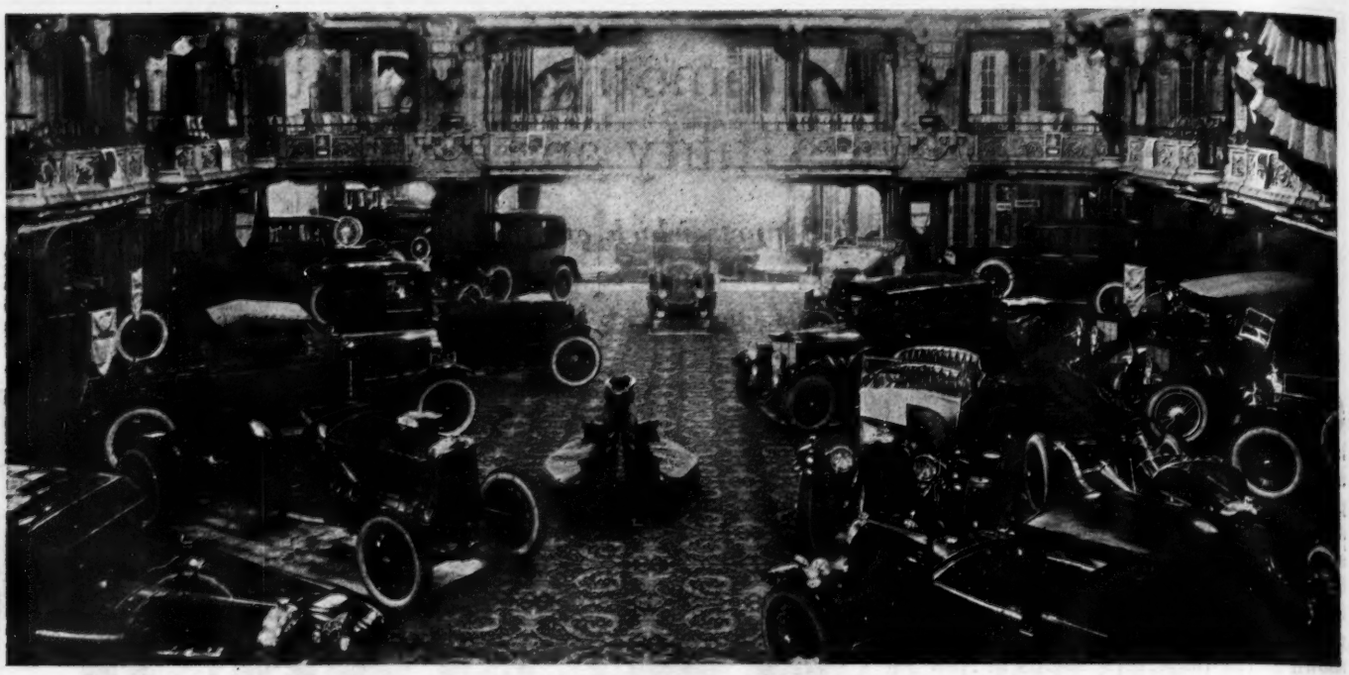
Double Belt Line on Brewster Body

Another development in body lines is shown on one of the Marmon chassis equipped with a Brewster body. In this case there is a double belt line. The upper line is carried around the upper edge of the body at the rear while the lower line parallels the upper until it approaches the lower rear quarter, where it bends downward and disappears behind the rear fender. A photograph showing this feature is reproduced in an accompanying cut.

When a double belt line is employed it is usual for the lower molding forming this line to be carried forward to the radiator along the joint of the hood, while the upper line is carried across the body under the windshied, or ends at the forward pillar.

Various expedients tending to make closed bodies lower are still resorted to. One of these is seen in the Renault brougham fitted with a Kelner body. In this case a special frame with a drop back of the driver's seat is employed to bring the floor almost down to the run board, thus making a low step and a low body without unduly sacrificing head room.

Bodies of the brougham and cabriolet type are among the most popular for town use. Some of these are built



General view of exhibit of Foreign Automotive Association at Hotel Astor

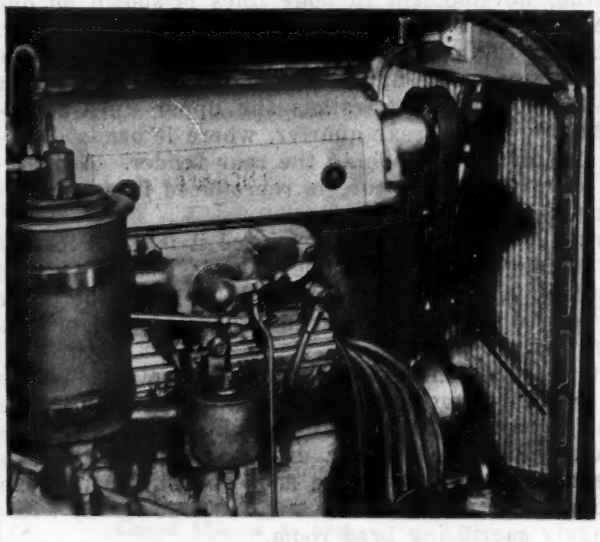
with seats for two passengers only and have no window in the rear quarter panel. A particularly smart appearing body of this type is that mounted on a small Voisin chassis. This body, shown in an accompanying cut, was built in the Voisin factory and is said to be a duplicate of one sold to the Queen of Spain. This car is finished entirely in black and is trimmed with pearl gray upholstery with no pleats or tufts.

Quarter panels in the Voisin brougham just mentioned are of solid metal. The roof projects slightly over the side and rear panels, giving sharp, square corners. In some other jobs these rear panels are covered with leather or fabric leather, which is sometimes decorated with landau joints finished in nickel, and is sometimes plain.

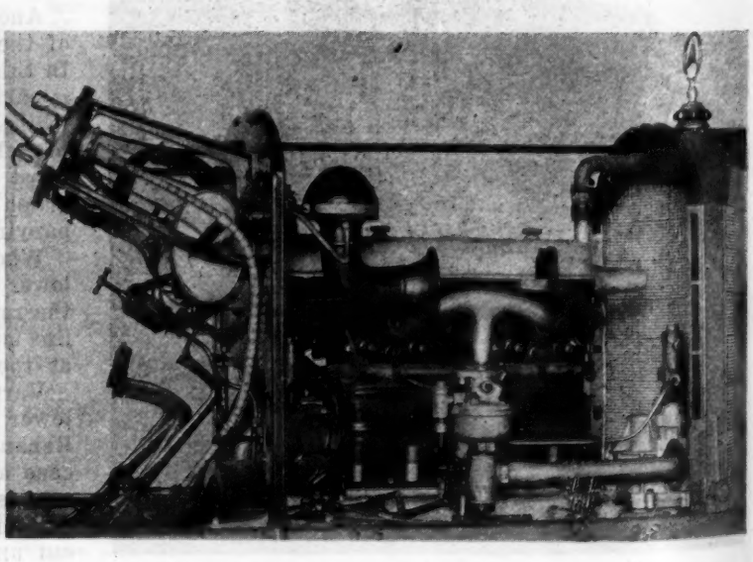
In the case of the Hotchkiss cabriolet the rear quarter is made to fold backward, but in other somewhat similar bodies the top is permanent, although the appearance of a folding top is given by the use of the landau joint. Construction employed by Locke in the body on the Hotchkiss is shown in an accompanying cut.

This same cut illustrates also another feature which is quite popular, namely, an arm rest dividing the rear seat into two halves. In this and in some other constructions the arm rest is hinged and arranged to turn backward into the rear cushion, thus providing room for a third person on the rear seat. In other bodies, some open and some closed, a divided rear seat is employed, the central arm rest being removable or arranged to fold into the seat back when a third passenger is to be carried.

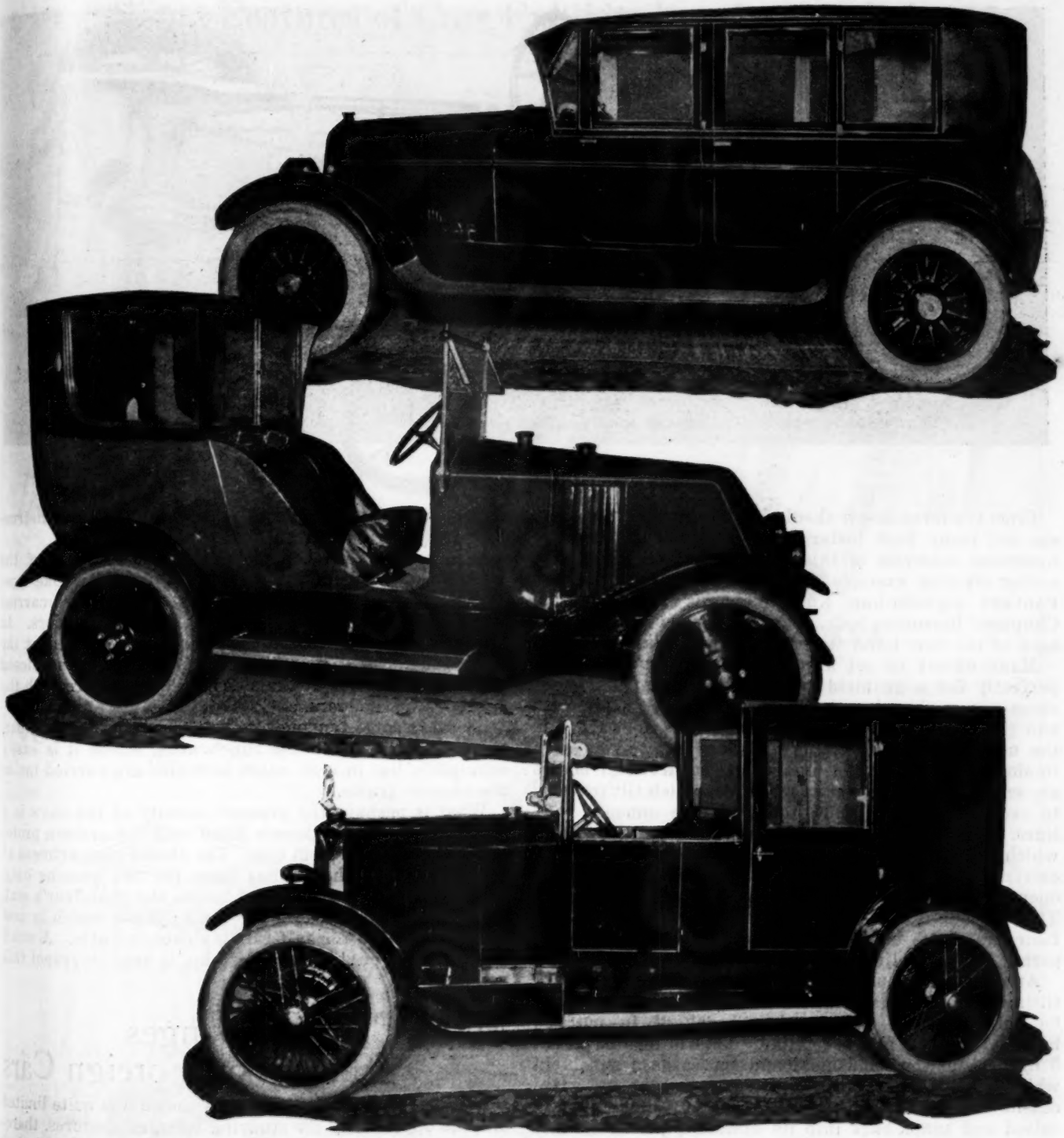
Interior trimming of the closed cars exhibited generally was done in broadcloth. Gray, taupe or light tan shades are most popular and some lace trimmings are employed on the more elaborate jobs. Practically no mohair was in evidence and only one or two velour trimmed jobs were to be seen. Bedford cords were employed in some cases, especially in sport or utility sedans. In one of the Brewster sedans on a Marmon chassis



Steiger four-cylinder, eight-valve engine



Inlet side of Mercedes four, showing supercharger located just back of the radiator

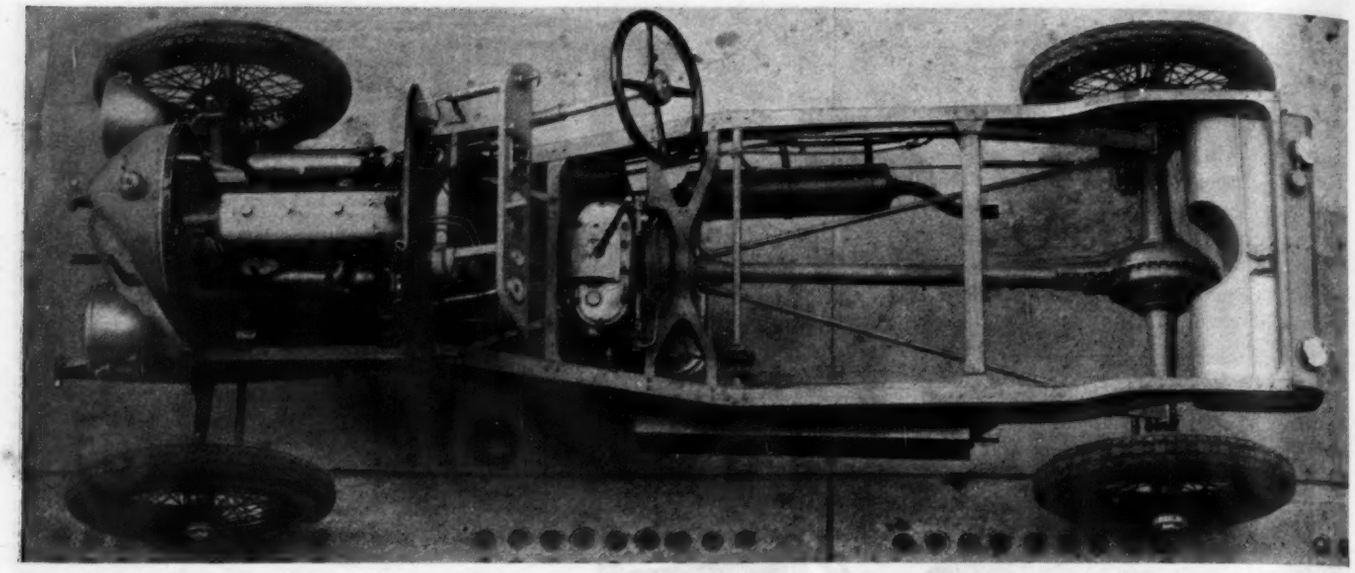


Top—Brewster sedan on Marmon chassis, showing double belt line. Center—Renault's diminutive hansom cab, one of the novelties of the show. Bottom—Voisin "Coupê de Ville," said to be a duplicate of a car sold to the Queen of Spain

interior trim was in natural oak, with cane interior door panels. Fabric used on seats in this case was an English Bedford cord.

Nickel trimming for exterior lamps and other fittings continues most popular, but some few examples of brass finish are seen. Practically all cars are fitted with some form of bumper, which is usually nickel plated. One popular design has an upper and lower band in nickel plate with a central painted stripe countersunk below the nickel trim. Interior fittings vary considerably in finish, but much highly polished nickel or silver is used.

There is in evidence a marked tendency toward the use of dull rather than a lustrous exterior finish, especially on closed models. Some of these bodies, including particularly some Brewster and some Locke bodies, are finished without any varnish coats, a special paint being employed. This is said to be exceedingly durable if reasonable care and no soap are used in washing. Most of the flat finish jobs are in gray or grayish green tones, which are not confined to the lower panels of the body but are used also on the superstructure to some extent. Moldings around the windows and the belt line are sometimes finished in a darker shade or in black, but there is a tendency away from all black uppers which have been so widely used, especially on large production jobs, heretofore.



Mercedes chassis

From the foregoing it should not be inferred that there are not many high luster varnish jobs, for there are numerous examples of this type still to be seen. One rather striking example of bright finish is seen on a Panhard eight-in-line Knight chassis fitted with a Chupurdy limousine body, which is finished in black with each of the four lower door panels in brilliant red.

Many efforts to get away from the conventional or perfectly flat windshield are to be seen. A number of these are combined with the visor and are made with two panels, the lower one of which tilts forward and the upper backward, giving a V-shaped front as seen in side elevation. But a number of the Brewster bodies shown are fitted with flat windshields, which tilt forward to avoid unpleasant reflections and give unusual body lines. Most of these are made with two panels, one of which is stationary, while the other, in front of the driver, has a narrow, sliding glass which is readily opened to give a clear vision in case of severe storm. This is locked and kept from rattling by two pinch fasteners which engage with notches in the frame and permit of easy adjustment.

Another feature used in combination with this forward-tilting windshield is a roller leather curtain which can be quickly drawn downward and caught in notched brackets at each forward pillar. This is located about 6 in. back of the windshield and serves as a sunshield which enables the operator to drive toward the sun without having the sun in his eyes. The curtain is quickly raised and snaps back into its upward position against the roof when not required.

In some few cases designers have got away from an instrument board which is flush or approximately flush with the rear edge of the cowl. This is noticeable on Marmon and Hotchkiss jobs in particular. Such instruments as are required are mounted on a board well under the cowl and not far back of the dash.

One of the Brewster sedans mounted on a Brewster chassis has a novel rear seat arrangement. The rear back cushion is hinged on two links at each side, so arranged that it can be raised flush with the upper back panel, thus exposing a space under the rear deck which can be used for carrying luggage, golf bags or the like. This short rear deck has no outside opening. The rear seat cushion is itself hinged with its support, so that it, too, can be turned into a vertical position, thus leaving the space back of the front seats free for carrying a trunk or other large pieces of luggage. This construction is illustrated in an accompanying cut.

Disk wheels are conspicuously absent. All of the wheels shown are of the wire, wood or steel spoke type. In almost every case spare wheels or shoes are carried on the run boards just back of the front fenders. In only a few instances are the spare tires carried at the rear, and these are mostly on open bodies or on closed jobs in which tires at the sides might interfere with the full opening of doors.

There is some tendency to return to the use of a battery box mounted on the run boards, where it is easily accessible, but in most cases batteries are carried inside the chassis frame.

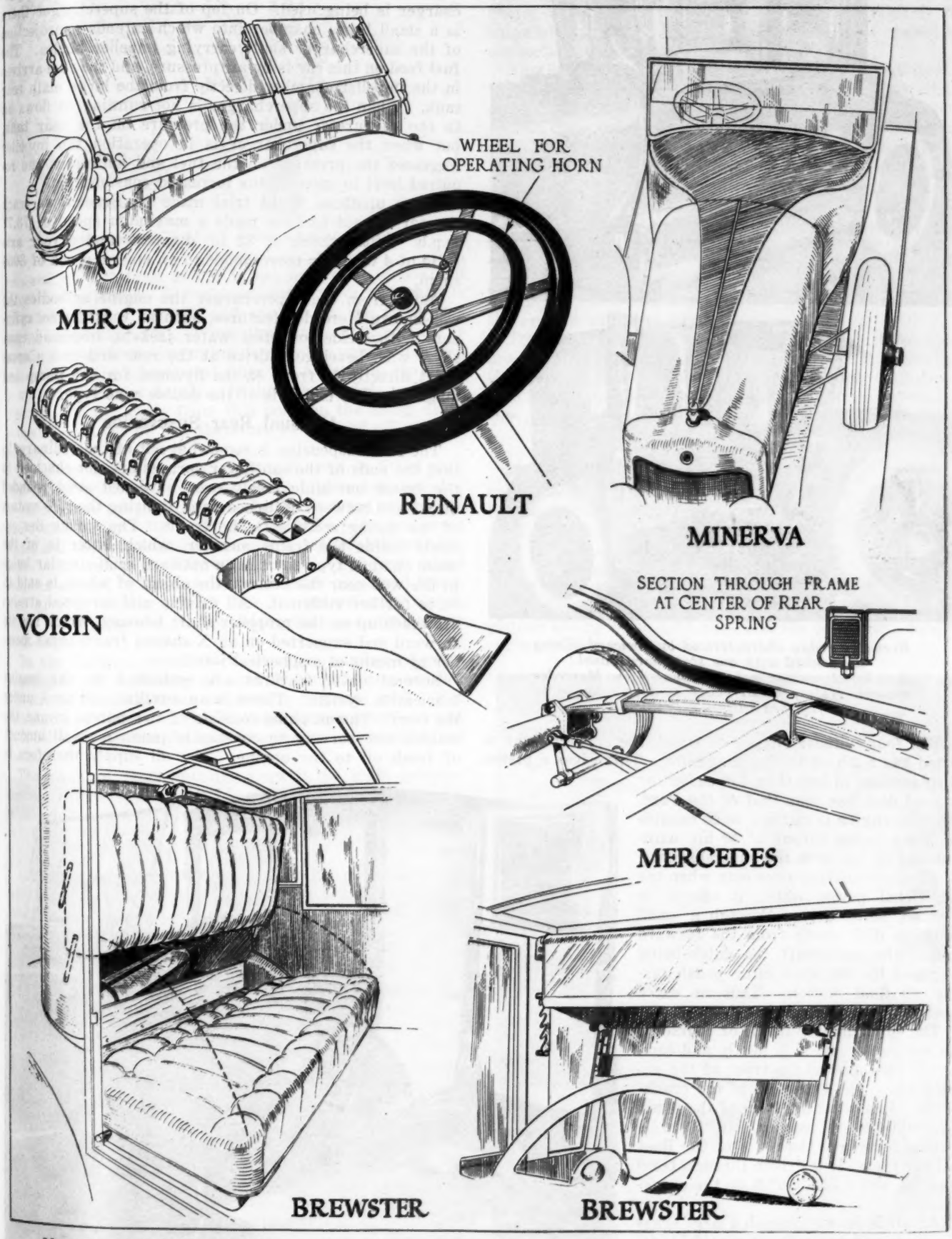
What is perhaps the greatest novelty of the show is a diminutive Renault chassis fitted with the modern prototype of the old hansom cab. The closed compartment at the rear of the chassis has room for two persons only. A single door opens forward beside the chauffeur's seat. This body is mounted on the same chassis which is now extensively used for half-rate taxicabs in Paris. A small four-cylinder engine rated at 6 hp. is used to propel this vehicle.

Many Chassis Changes Shown on Foreign Cars

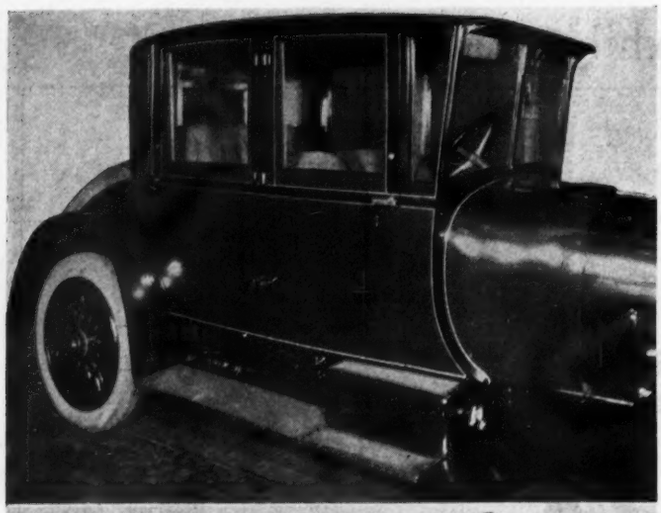
The number of stripped chassis shown was quite limited and the opportunity for studying technical features, therefore, was not great. Of most importance from a technical standpoint undoubtedly were the front wheel brakes fitted to the Locomobile, which are being offered as optional equipment. An illustrated description of these appears elsewhere in this issue.

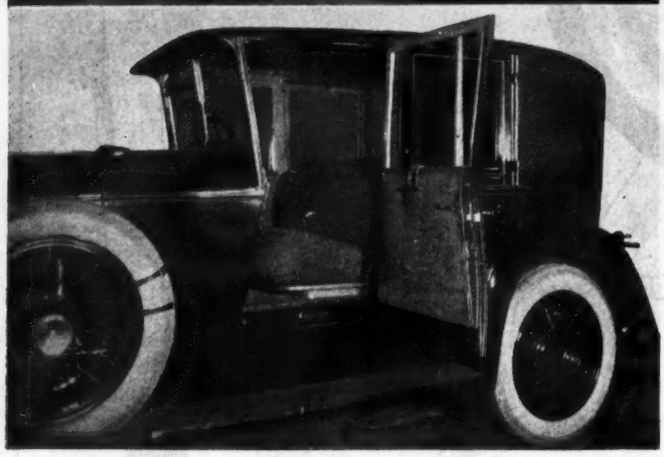
Another engineering feature publicly exhibited in this country for the first time was the supercharger on the Mercedes four-cylinder chassis. Superchargers have been given a good deal of study in connection with airplane engines, their object in that application being to maintain the power of the engine at high altitudes, where it ordinarily falls off greatly owing to the rarefaction of the atmosphere. On the Mercedes car the supercharger is used to permit of the use of a comparatively small engine, which means a low tax rate and a high fuel economy, while being able to obtain high power and to travel at high speed when desired, by throwing in the supercharger.

Some Features of Cars Exhibited at Astor Salon



Mercedes windshield on phaeton. Either half can be opened or the whole shield folded forward over the cowl. Inner ring on Renault steering wheel enables horn to be sounded without removing hands from rim. Hood with raised tongue which accentuates narrow bonnet. Voisin cast aluminum muffler. Mercedes spring arrangement. Note unusual section of frame folding rear seat and back compartment on Brewster sedan. There is room for a trunk when rear seat is swung upward. Adjustable curtain and forward tilting windshield on Brewster bodies.





Brewster sedan characterized by forward tilting windshield with one stationary panel
Another Brewster sedan, mounted on Mercedes chassis. Note peculiar shape of door made to fit forward tilting windshield

The four-cylinder chassis to which the supercharger is fitted has a 3 3/16 by 5⅛ in. engine. This gives a piston displacement of less than 160 cu. in., or a good deal less than that of the Ford, yet this engine is claimed to be capable of a maximum output of 40 hp. without and 66 hp. with the supercharger.

The supercharger runs only when the additional power which it affords is wanted, being driven through a small multiple disk clutch from the forward end of the crankshaft, the clutch being engaged by the accelerator pedal during its final motion. Thus no extra operating device is required.

The supercharger itself, of course, is an air pump, and it is neatly and compactly arranged at the front of the engine above the extension of the crankshaft. Just what the form of the pump is could not be learned, but there is reason to believe that it is of the Root blower type. It is driven through bevel gearing and a disk clutch on the crankshaft.

All air is drawn through a large brass air heater on the exhaust manifold, directly below which there is an air filter. From this filter there are two outlets, one passing through the cylinder block to the carbureter on the opposite side, the other to the supercharger. There is a butterfly valve in the pipe leading to the carbureter, which is closed when the supercharger is being used. On top of the supercharger there is a small brass chamber into which extends a projection of the supercharger shaft carrying impeller blades. The fuel feed on this car is by air pressure, and the fuel arrives in the impeller chamber directly from the large main rear tank. When the supercharger is not running, it flows on to the carbureter under the pressure on the rear tank, but when the supercharger is in operation the impeller increases the pressure on the fuel and maintains the required level in spite of the increased consumption.

In an unofficial speed trial made on Brooklands track the car is said to have made a maximum speed of 73.77 m.p.h. With wheels of 32 in. diameter and a rear axle ratio of 4 to 1 this corresponds to an engine speed of 3060 r.p.m.

Aside from the supercharger the engine embodies the well-known Mercedes features, such as forged steel cylinders with welded-on steel water jackets, overhead camshaft with bevel gear drive at the rear end and a cross shaft directly in front of the flywheel for the pump and magneto. The clutch is of the double cone type.

Unusual Rear Suspension

The rear suspension is somewhat out of the ordinary, in that the ends of the cantilever springs are not shackled to the frame but slide freely over hardened steel rounded blocks and between upturned flaps, limiting the side motion of the spring relative to the frame. The spring lies entirely inside the frame member, which latter is of the usual channel type but has an outward semi-circular bulge in the web near the bottom, the object of which is said to be to further stiffen it. All driving and torsional strains are taken up on the propeller shaft housing, which has its forward end supported on an X-shaped frame cross member by means of a spherical joint.

Several novel features are embodied in the engine lubrication system. There is an auxiliary oil tank under the cowl. The oil pump consists of two pumps in one, the smaller one serving to constantly pump a small amount of fresh oil to the engine. The oil supply therefore is

Renault brougham with drop frame, giving low step and body without undue restriction in head room

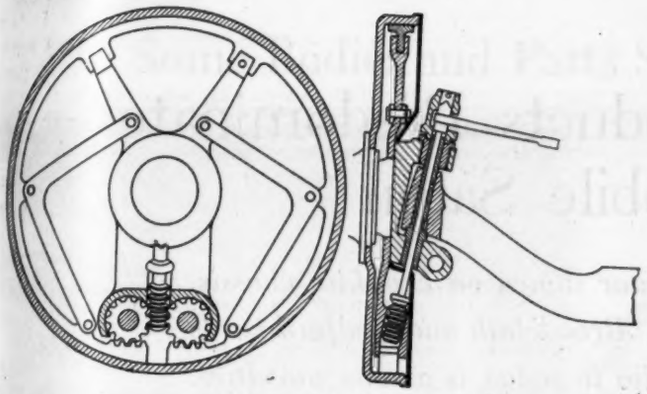


Diagram of Panhard front wheel brakes

renewed at this tank and it is not necessary to pour oil into the crankcase. A combined drain valve and gage is mounted on the front left and another on the right rear engine-supporting arm. When the handle of this valve is pointing away from the engine an overflow valve is opened, indicating to the operator whether the oil level in the sump is up to the desired height. If the valve handle is turned through a right angle from this position the sump drain is opened and the oil can therefore be drained off without getting under the car.

The six-cylinder Mercedes, also exhibited, is fitted with four-wheel brakes. The front wheel brakes are operated by steel cables passing through the brake drum cover plate and over a pulley. By means of the brake pedal the front wheel and the transmission brake are applied, whereas the brake lever applies the four-wheel brakes. The front wheel spindles are set ½ in. back of the knuckle pivot and therefore give a trailing effect. On the six-cylinder model, which has 4⅛ by 5½ in. cylinders, the rear springs are semi-elliptic.

On the Renault stand were shown a number of components, and it is worthy of note that on the two smaller Renault models duralumin connecting rods are used. The constant mesh gears in the Renault transmission are cut with helical teeth and the transmission has unusually rigid shafts.

The Panhard representative showed the eight-cylinder vertical Knight-type Panhard, which, though not a new model, embodies a number of changes.

Change in Brakes

Last year the Panhard company used flat steel bands for transmitting the brake pull to the rear brakes, but these bands have now been discarded in favor of steel tubes. The model has four-wheel brakes and the drums on all four wheels are of unusually large diameter, between 16 and 18 in. On the rear wheels there are really double brake drums, one set within the other. The design of the front wheel brakes, which formerly had the operating lever below the steering head, has been changed as shown in the diagram herewith. Two bell cranks are pivoted with one end to the brake-supporting spider. What corresponds to the fulcrum of these bell cranks is pivoted to the brake band about 90 deg. from the end, while the other ends of the bell crank are pivoted to the band near its ends. The brake spider also carries a pair of spur pinions meshing with a circularly grooved rod and with racks cut on the inside of the ends of the brake band. The grooved rod is given an axial motion by means of a face cam on the hub of the operating lever.

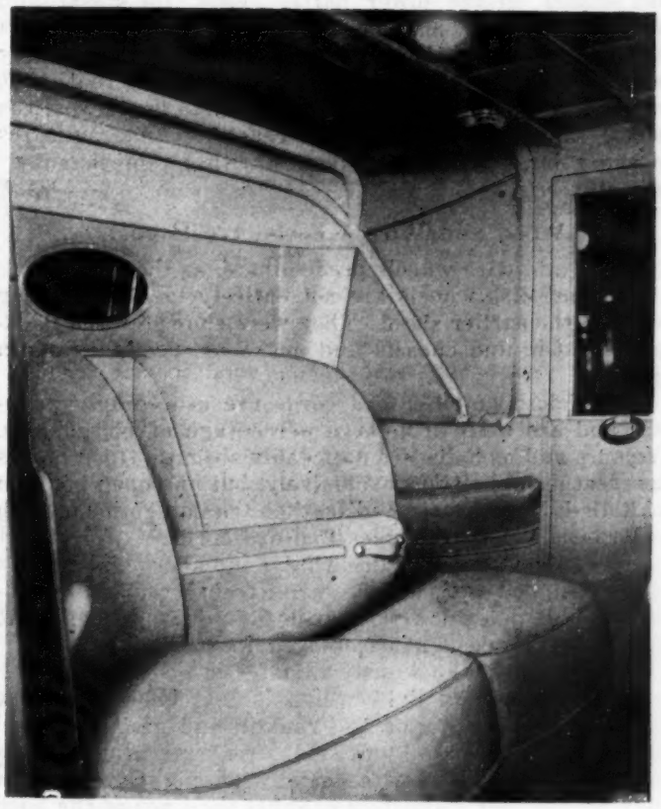
This car is fitted with two magnetos, each serving four of the eight cylinders, and it also carries two storage batteries, which latter, however, are connected in series and therefore constitute only a single 16-volt battery, the electrical equipment of the car being a 16-volt system. Arranging the battery in two units makes it easier to handle. This car is made with a special gear ratio for the United States (3⅞ instead of 3¼). A throttling valve is incorporated in the oil distribution line, which is opened by connection with the accelerator.

Another Knight-type car of French make exhibited is the Voisin. This has a very high speed four-cylinder engine claimed to be capable of developing 116 hp. at 4000 r.p.m. On account of the high engine speed it was found expedient to provide an extra oil feed to the valve sleeves. The extra oil is fed directly to the sleeves and is controlled by the suction in the manifold. An interesting feature of this car is the muffler, which is made of two aluminum castings that are bolted together. The two castings are similar in shape and form the upper and lower halves of the muffler. There are two cylindrical chambers side by side. The exhaust gases enter the one through the exhaust pipe, then flow across to the other and pass out at the rear through the discharge pipe.

The only points on this car having grease lubrication are the spring shackles. About a gallon of oil is put into the gearcase, and this oil runs right through to the rear axle, to which the gearcase is joined by the housing of the propeller shaft.

New German Car Design Shown

Besides the Mercedes there was another German car at the show which was new to this country. This is the Steiger, a four-cylinder car with an unusually long stroke, the bore being 2⅞ in. and the stroke 6 5/16 in. The engine of this car also has an overhead camshaft, but the form of camshaft drive could not be made out. Each cylinder has two valves, the inlet valve seating in a cage and the exhaust valve directly in the cylinder wall. The pistons are made of light alloy and the connecting rods of chrome nickel steel.



Seat and roof construction in Locke limousine-landaulet body on Hotchkiss chassis. Note folding arm rest

American-Built Products Predominate at Automobile Salon

Special bodies with dummy radiator shown on Franklin chassis. Minerva adds front-wheel brakes. Broadcloth and Bedford cords are popular for upholstery. Radio in sedan is among novelties.

THE automobile salon at the Hotel Commodore showed many trends and several exhibits similar to those at the Hotel Astor show the week previous. Points of difference were numerous, however, partly because of the larger proportion of American-built products at the later exhibition.

There were, for example, more cars with high luster finish at the Commodore, although some of the smartest appearing bodies of the lot had dull or eggshell finish and one Meritas fabric body was shown. Double or quite wide belt lines, in which various arrangements of moldings were employed, were used on numerous bodies of all types and there were a few examples of two-color or two-tone bodies in which the upper part of the bonnet and parts of the body above the lower belt line were dark, while the remainder of the lower part of the body was a lighter color or shade.

As in the Astor show, there were fewer black superstructures on closed models than in previous years, and all-black jobs were rare. Many concerns had two-tone or two-color effects for the superstructure to match similar shades on the lower parts. Thus, the pillar and window moldings may be dark gray to match fenders and chassis, while the other parts of the body, including a frame around the windows and perhaps the roof, also, may be tan or buff. This effectively gets away from the stock appearance which necessarily characterizes cheaper large production bodies with all black superstructures.

Wood and Wire Wheels Are Popular

Wood and wire wheels predominate, as they did at the Astor, but disk wheels are not entirely lacking, as they were at the earlier show. They were shown on the Packard eight-in-line chassis and on some special Franklin jobs.

Broadcloth and Bedford cords are exceedingly popular and are used in a large percentage of closed jobs. Velours and mohairs are noticeably absent. Open bodies use leather upholstery exclusively, but one open body on a Rolls-Royce chassis had leather trimmings made with a pattern which resembles Bedford cord.

J. F. de Cause is exhibiting a number of Franklin cars equipped with a new shape front or dummy radiator. This is a square corner design, quite dissimilar to anything Franklin has employed in stock jobs.

At the top of the dummy radiator is a small compartment containing a light which is just back of a blue glass containing the name Franklin and giving a novel appearance. This illuminated sign naturally attracts considerable attention, especially at night. The new dummy radiator materially changes the lines of the hood and gives the car a much different appearance from its usual one, as will be seen by the accompanying cut.

These cars are fitted also with what appears to be a new design of disk wheel. The hub of this wheel is made with a flange having five radial ribs or reinforcements on the inside and the disk is bolted to this flange by bolts whose head is on the inside and whose nuts are of sleeve form, with a flange on the outer end which is all that projects beyond the disk. The hole through the nut is squared at its outer end to take a plug wrench.

At this show a number of the exhibits are by body manufacturers, a large majority of the cars being mounted on high-grade American chassis, including Locomobile, Cadillac, Packard, Peerless, Lincoln, Duesenberg, Winton, Cunningham, etc.

Hume Body Had Sliding Rear Seat

Hume Body Corp. is showing a four-seated coupé on a Marmon chassis which has attracted some attention chiefly on account of the seat construction. The fourth seat is arranged to fold under the cowl in conventional fashion, but the rear seat, which is ordinarily stationary, is in this case divided and mounted on ways so arranged that part of it can be slid forward when the folding seat is not in use. This enables the occupant to sit side-by-side with the driver in an unusually comfortable and roomy seat, and gives also, in back of the seat, a quite large space for carrying luggage. In back of the driver's seat there is also a large package compartment, besides which is the stationary part of the rear seat. When the movable section of this seat is in its rearward position it is sufficiently wide for two persons.

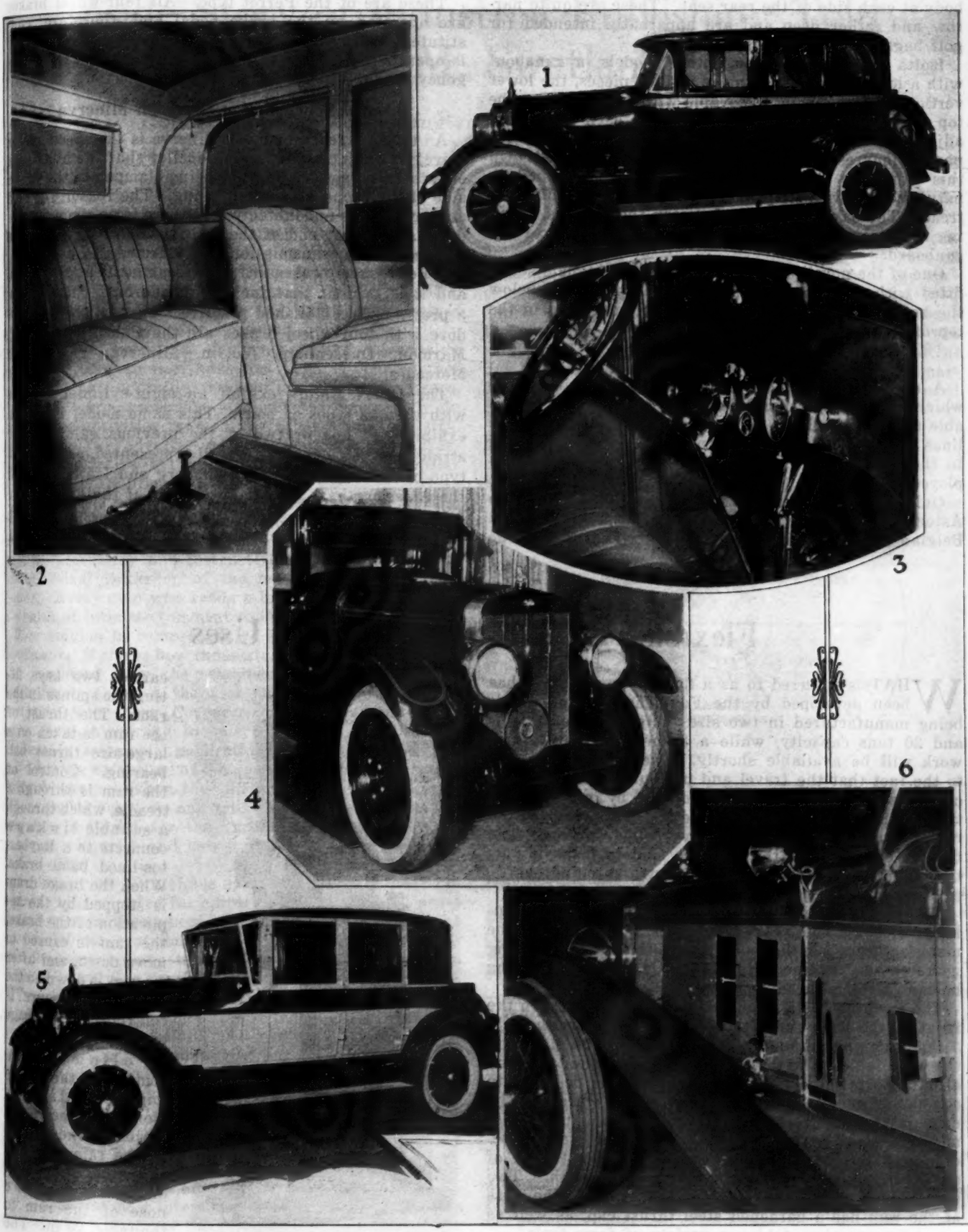
There have been a few changes in the Meritas body construction, but in the main this body resembles those shown heretofore. No paint is used, the entire body being covered with fabric leather, except the lower panels of the bonnet and the fenders, which are enameled. The fabric leather covering of the panels is carried well around the door pillars, and there is also a rather wide sloping arch covered with fabric leather between the lower edge of the tilted windshield and the instrument board.

Spare Tires Carried on Runningboards

Of the cars shown a larger percentage have spare tires or wheels mounted in the rear than was the case at the Astor show, but there are also many spare tires carried on the runningboards beside the hood.

Many windshields are pointed, with the lower pane tilting forward and the upper pane backward. When this construction is employed it is usually combined with a visor, and in one or two cases with an extra strip of glass intended to prevent entry of rain when driving in a storm. An example of this construction is seen in the Springfield body on a Peerless chassis shown in one of the accompanying cuts. This same body exhibits also the double belt line and two-color effect mentioned above.

Some Bodies and Parts Seen at Commodore Salon



1—Latest edition of Meritas fabric leather body Belt line has two moldings with cane between. 2—Interior of Hume coupé on Marmon chassis, showing divided sliding rear seat. 3—Leather covered arch above instrument board on Judkins coupé. 4—de Cause closed body on Franklin chassis. 5—Springfield sedan on Peerless chassis. Note two color effect and double belt line. 6—Isotta Fraschini bonnet and cowl.

Cunningham is showing one four-passenger phaeton with two doors and large compartments built into the body at each side of the rear seat. These are quite narrow and rather deep and are apparently intended for golf bags and other luggage.

Isotta is showing, among other models, a runabout with a long, narrow hood made in four pieces, the lower vertical sections being removable without disturbing the top sections. These lower sections are each fitted with adjustable doors in place of louvres, but there are three narrow louvres in the cowl just back of the bonnet. On this same job the runboards are of oak, finished in natural color, with strips of nickel trimming forming the tread. The oak is cut away between these strips, forming a series of hollows parallel with the length of the runboard.

One of the novelties of the show is a Springfield sedan fitted with a radio set installed in a space just below the back of the front seat, with aerial concealed in the top of the car.

Narrow Bonnets Are Popular

A number of the cars shown are fitted with cowls which are inswept sharply at their forward end to enable the use of a long, narrow and graceful hood. Belt lines are almost invariably carried the length of the hood to the radiator, a great variety of striping being employed.

Only two foreign cars, other than those shown at the Astor, appear at the Commodore salon. These are the Belgian Minerva and the Italian Isotta-Fraschini. The Minerva shows no differences in design from last year's product except that front-wheel brakes have been added. These are of the Perrot type. All four-wheel brakes are operated by the brake pedal and, therefore, constitute the service brake, while the transmission brake is operated by the brake lever and constitutes the emergency brake.

Novel Speedometer Drive on Minerva

An unusual feature on the Minerva is the speedometer drive, which is taken off the propeller shaft near its rear end, the housing for the drive being clamped to the lower side of the propeller shaft housing. The reason for this arrangement is undoubtedly that there is no room for the drive at the rear end of the transmission case, which is masked by the transmission brake drum.

Four-wheel brakes are quite prominent at the salon, and it is evident that for high-grade cars this is now a pretty well established practice. Cars at the Commodore with four-wheel brakes are the Packard, Cadillac, Marmon, Duesenberg, Voisin, Minerva, Isotta and Mercedes.

The Isotta Motors exhibit an eight-cylinder chassis with various types of body. This same model has been exhibited at one or two of the previous salons. The straight or vertical eight is well represented, cars of this type being the Packard, Duesenberg and Isotta. All of the American cars with the exception of the Rolls-Royce have left-hand drive, while all of the foreign cars with the exception of the Renault have right-hand drive.

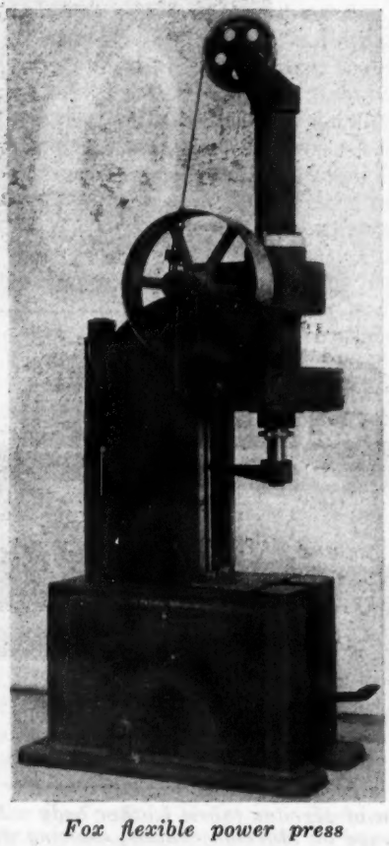
Flexible Power Press Has Many Uses

WHAT is referred to as a flexible power press has been developed by the Fox Machine Co. and is being manufactured in two sizes at present, of 8 tons and 20 tons capacity, while a 3-ton press for lighter work will be available shortly. The flexibility is due to the fact that the travel and pressure of the ram are controlled through a friction clutch by means of a treadle and if the pressure on the treadle is removed the ram is quickly returned by heavy coiled springs. The flexible character of the press is said to make it particularly suitable for such work as straightening shafts, pressing in bushings, etc.

The machine appears to have been developed particularly with automotive requirements in mind, and the manufacturers mention such applications as assembling gears on shafts, assembling rear axle parts, burnishing holes to size and heading rivets cold.

The machine has a base of heavy box type. Down the front of the base under the center of the ram there is a slot which permits flanged shafts, etc., to be placed on the work table. The top of the base forms the table and also supports the column. The ram case is designed to completely inclose the worm and worm wheel of the drive, as well as the nut and friction band of the thrust mechanism. The ram, which is made of manganese-chrome alloy steel, is cut with a quadruple thread of coarse pitch to give adequate tooth strength. Two splined keyways are cut on opposite sides. The nose of the ram has a hardened steel thrust cap, as well as a special nosepiece taking a variety of form tools.

Rotation of the ram is effected by means of a steel worm meshing with a phosphor bronze worm wheel. This wheel is rigidly secured to a long steel sleeve which carries two keys fitting the splines in the ram. The thrust of the ram is taken on a large-size thrust ball bearing. Control of the ram is through a treadle, which through a suitable linkage connects to a Raybestos-lined band brake. When the brake drum is stopped by the application of the brake, the ram is caused to move down, and after the ram is down on the work its pressure is controlled by slippage of the brake.



Fox flexible power press

Following are some of the more important dimensions of the 8-ton pieces: The stroke of the ram is 18 in. and the maximum distance from the nose of the ram to the table, 20 in. The ram has a diameter of 2½ in. and the lead of the ram thread is 3 in.

Inside Story of Industrial Publishing Told by H. M. Swetland

How trade paper advertising rates are set, how editorial copy is procured and written and how circulation can be appraised, among topics in new book by United Publishers Corp. president.

EVERYBODY likes to go behind the scenes. There is something subtly gratifying about getting the "inside story" about anything with which we have been familiar only from the outside. Secret memoirs, visits through the stage door and detailed narratives about an industry all have a peculiar appeal.

Automotive executives in general, and advertising managers in particular, have had a front door contact with business or trade publications for many years. Probably more magazines are devoted exclusively to automotive activities than to any other single industry. As readers, as advertisers and as prospective advertisers, automotive manufacturers have been familiar with their trade press for some time.

Through the medium of a new book, however, written by Horace M. Swetland, a publisher of forty years' experience, executives are given a chance to take a thoroughly interesting and instructive trip into the mental and physical workshop of the modern industrial publisher. Every man who reads a business paper will find a wealth of intimate comment to hold his attention.

The volume is comprehensive in scope, but brief in treatment. It shows how industrial publishing has grown and developed since the establishment in 1795 of *New York Prices Current*, the first business paper, which is now the *New York Commercial*. One hundred years later, it is interesting to note, *Horseless Age*, the first exclusively automobile publication, came into the field.

Following an outline of the general organization necessities of the publisher, the author lifts the curtain from the editorial sanctum and tells how the editor does his job, how material for the various departments of the paper is procured, and how it is handled after arriving in the office.

A chapter on "Principles of Writing for Business Papers," while intended for editorial workers, should prove useful to men throughout the automotive industry who are occasional contributors to business publications or who frequently have to prepare reports in connection with their regular routine.

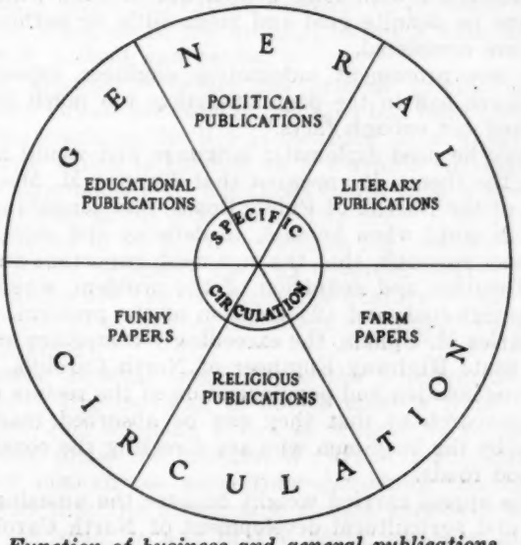
Four chapters are of very direct importance to the advertising manager. The titles of these are:

Building Circulation,
Advertising, a dominant factor in modern business,
Methods of selling advertising,
Advertising service.

These chapters, like the book as a whole, are written primarily for the instruction of men in the publishing field, but for that very reason give the factory advertising manager an opportunity to understand clearly the methods and purposes of the business publisher.

Perhaps the most interesting section in these chapters is that which analyzes the difference in function of the general medium and of the paper with specialized circulation. "The scope of the two classes of publications is well illustrated," says Mr. Swetland, "in the accompanying chart.

"The area of the large circle indicates the general circulation covered by all the various papers of general appeal. The area of the small circle indicates the specific circulation of the various specialized papers in a single industry. The area of the large circle represents the entire reading public. This area also contains the small circle which includes the readers of a special industry and plainly shows that to reach all of the particular industry represented by the area of the small circle—without the use of the industrial papers cover-



Function of business and general publications contrasted

ing that industry—all general publications must be used.

"One publication in each field will not suffice. All of the publications in the educational, religious, agricultural, literary, political, fictional and humorous fields would be necessary in order to make sure of reaching every member in the special field.

"It is obvious that the use of the general publication when the desire is to reach only a small area fully covered by a paper or a few papers devoted exclusively to its interest, would entail an utterly useless, wasteful and extravagant amount of advertising."

Methods of fixing advertising rates are fully analyzed and tables and charts are used to visualize the relation between rates and circulation in the business paper field.

Growing out of a demand for industrial training in the field of business publishing and designed, in a sense, as a textbook for editors and publishers, "Industrial Publishing" opens a wide vista of interesting material for the general reader and considerable detailed information for the advertising manager. It is published by the New York Business Publishers Association, Inc., and can be obtained from the U. P. C. Book Co., 239 West Thirty-ninth Street, New York City.

Demand for Practical Highway Research Is Growing

"Isolation of problem" is first necessity, MacDonald says. "Make results easy to find," Upham urges. Annual Advisory Board Meeting at Washington

METAMORPHOSIS of highly technical research into various problems of highway construction and maintenance from the theoretical to the practical seems to have begun.

Profound interest in many of the surveys which are under way was evidenced at the third annual meeting of the Advisory Board of Highway Research and the National Research Council, held at Washington last week, but there was ill-concealed impatience on the part of many in attendance with long drawn out studies which seem to have no definite goal and mean little or nothing when they are completed.

As one prominent automotive engineer expressed it, "We have had in the past altogether too much conversation and not enough facts."

While he used diplomatic language and would not elaborate the theme, it appeared that Thomas M. MacDonald, chief of the Bureau of Public Roads, had something of the kind in mind when he said, in defining the objectives of highway research, that the two most important steps are: (1) isolation and definition of the problem, which is too often neglected, and (2) solution of the problem.

Charles M. Upham, the exceedingly competent and practical State Highway Engineer of North Carolina, pleaded for condensation and popularization of the results of highway research so that they can be absorbed readily and easily by the busy men who are directing the construction of good roads.

This appeal carried weight because the amazing industrial and agricultural development of North Carolina has been almost coincidental with the development of a State highway system. Upham's motto has been "continuous road service for the user of the highway," and he might have added with a minimum of expense by the utilization of building materials to be found in the localities through which the road passes.

Facts Often Buried

It was Upham's contention that not infrequently highly important facts are so cleverly concealed in reports on highway research that few persons have time to dig them out of the tomes in which they are buried. Failure to apply such conclusions, which are not readily available, results in economic loss.

It was apparent that considerable sympathy for these views was felt by representatives of the automotive industry at the meeting, who included:

H. W. Alden, Society of Automotive Engineers.
H. M. Crane, Society of Automotive Engineers.
D. C. Fenner, Motor Vehicle Conference Committee.
Charles M. Manly, Society of Automotive Engineers.
M. O. Eldridge, American Automobile Association.
S. H. Woods, Mack Trucks, Inc.
William G. Kearney, B. F. Goodrich Co.
J. C. Sproull, B. F. Goodrich Co.
B. J. Lemon, U. S. Rubber Co.

One of the interesting features of the meeting was the informal presentation by William S. James of the results of experiments he has been conducting at the Bureau of Standards for the past three of four months on the relative efficiency of two and four wheel brakes and the effect of different brake linings on the deceleration of cars of various makes. These tests, made with a decelerometer, will be described in an early issue of AUTOMOTIVE INDUSTRIES. They were undertaken chiefly because of the recent movement for police inspection of brakes.

Tax Distribution Incorrect

Prof. J. G. McKay, economist of the Bureau of Public Roads, in his report as chairman of the Committee on Highway Finance, contended that too large a proportion of the funds used for highway construction come from taxes levied against real estate. His observations were based largely on a survey undertaken in four Wisconsin counties in 1915 to determine the effect of highway improvement on land values. This work was completed in 1921, and a similar inquiry on a large scale in Iowa is nearly finished.

The full results will not be announced until there has been opportunity to check the two against each other. McKay said, however, that the greatest increment in land values comes with the primary improvement. The increase in values decreases with each subsequent improvement.

In the discussion of McKay's report, which appears on a following page, Chief MacDonald pointed out the danger of the tendency to look to the user of the highway for additional revenue. Undoubtedly the road user should bear his full share, he said, but he warned that the "motorist will get his" in ten or fifteen years if information about depletion of the gasoline supply is correct. Before the road building program is completed the increasing cost of fuel will be a big factor. The motorists of the United States, "which means the entire public," are demanding highways de luxe instead of economic highways. They will have, therefore, in addition to higher motor vehicle operating costs, a heavier burden for highway maintenance.

Bond issues will be coming up for payment at about the same time, MacDonald pointed out, and if motor vehicle fees are mortgaged too heavily to meet these bonds, States will have to resort to property taxes. He thought it wiser to resort to such levies while owners are benefiting most from natural wealth and land values increased by highways. He used as an illustration the present situation in Nevada, Arizona and Montana, where most of the mineral wealth has been taken out of the ground and where it is absolutely impossible for motorists to pay the cost of road building. He asserted that these States could have ob-

tained their schools and highways while they still had great natural wealth, but that it will be a tough job to get them now. He felt that a fair portion of property value increment should be taken by this generation in highway taxes.

H. W. Alden drew a parallel between the effect on land values of good roads and rapid transit facilities. He stated that land values of a strip half a mile wide along a transit line in New York increased in value from 500 to 700 per cent when the new line was constructed, although the owners did not contribute a cent toward the cost of the facilities. Detroit, he said, proposes to remedy this evident inequality in extending its transit system by a legislative enabling act which will be based on the theory that all property is benefited by these improvements so that it can take a part of the cost of them by a tax on land benefits.

M. O. Eldridge of the American Automobile Association, speaking for the motorists of the country, declared they were entirely willing to pay their share for the construction and maintenance of highways.

Prof. T. R. Agg of the State College of Iowa, chairman of the Committee on Economic Theory of Highway Improvement, stated that he was trying to compute exactly what it cost per ton mile to transport goods over a dirt road so that it could be determined when it would be cheaper to put down a hard surface. Iowa has decided that when you get as many as 300 vehicles a day the dirt road should be abandoned.

Agg estimated that the total cost of vehicle operation in Iowa this year would be around $240,000,000, while road costs would be only $25,000,000. Vehicle costs, he holds, will show the relative value of different types of highways.

An exhaustive report on the results of research on highway design was presented by A. T. Goldbeck of the Bureau of Public roads, chairman of the Committee on Structural Design of Roads. He recommended 26 problems for further research, including:

1. More definite information as to the average and maximum value of the load and impact forces that have to be considered for each type of road.
2. The relative destructive effect of different types of vehicles; this with reference to types and weights of axles, chassis and load distribution.
3. Importance of proper tire equipment.
4. A simple and definite method of testing tires to determine relative cushioning quality.

The report presented by the Bureau of Standards covering research which it is carrying on in relation to rubber tires appears on a following page.

Traffic Survey Recommendation

The following recommendation in relation to future traffic surveys was contained in the report of the Committee on Highway Traffic Analysis, of which G. E. Hamlin of the Connecticut Highway Commission is chairman:

"The committee believes that while a traffic count is of value, more details should be considered than has been customary in the past, so that an analysis of present and probable future traffic may be made as stated in a previous paragraph. This census must include enough detail and be taken over an extended period of time so as to determine the seasonal traffic, which varies greatly in certain parts of the country and which is a maintenance rather than a construction problem. The construction type must be based on the heaviest travel rather than on average or seasonal travel.

"A determination should also include the effect of slow moving vehicles upon the general situation and the consideration of the possibility of legislation which will remove such vehicles to secondary roads during high peaks of traffic. This may include a recommendation for legislative act to govern the minimum speed permitted upon Class A roads during certain hours of the day or times of the year. It is believed that the slow moving vehicle is often the cause of congestion upon a main highway; that the importance of this fact is not at the present time understood, and that the capacity of the road can be largely increased by restrictive regulation."

Tire Test Results Given by Bureau of Standards

The following report on research in relation to tires was presented by the Bureau of Standards:

The various departments of the Government spend in the neighborhood of a half million dollars per year for pneumatic tires. Inasmuch as these are purchased on a competitive basis the setting of proper standards to be used as a basis of purchase is a very important consideration. The Bureau of Standards, in conjunction with the other interested departments and tire manufacturers, has been instrumental in establishing a standard for purchases, and with the large volume of business it will be seen that a small percentage increase or decrease in the purchase price, or in the quality, means a considerable amount in dollars and cents.

In an attempt to better the present specifications a laboratory endurance testing machine has been installed. With this machine the tire is mounted on a wheel, free to revolve, which is carried on a movable carriage and pressed against a 5-ft. flat-faced drum with a pressure corresponding to the axle load. The drum is driven at a surface speed of 30 m.p.h., and thus the tire is revolved and subjected to flexing such as it would receive on the road. Cleats are bolted across the surface of the drum at intervals, so as to give the effect of bumps in addition to the flexing.

Contrary to what seems to be the popular idea, the problem in tire building is not to make a tread which will wear, but to make a tire in which the component parts—the plies, the breaker, the tread, etc.—will stay together, and at the same time distribute the various strains so that the strain will not be excessive at any point. As soon as any of the parts separate, chafing immediately sets in, blisters begin to appear in various places, and the life of the tire is about gone. Accordingly, in developing such a test the motive has been to produce primarily a carcass test, the question of tread wear to be taken care of as a separate test.

It has been found that the conditions under which a tire is run, that is, the air pressure used, the axle load and the nature of the cleats, have a big effect on the mileage which a tire will give on this machine. By changing these conditions different features of a tire can be tested. For instance, a high air pressure and small cleats seem to be particularly severe on the tread portion, and failure is apt to occur due to tread separation unless that particular feature is especially well designed. Larger cleats seem to cut down the mileage considerably and are especially severe on the carcass, so that failure is apt to occur due to ply separation or breaking of the carcass. If a set of, say, 10 different tires is run under each of the two different test conditions mentioned, the order in which the tires will line up with respect to mileage will probably be quite different.

Accordingly, the problem has been to so establish the test conditions that the method of failure will be the same as would result from average road service. As

I have stated before, such a machine does not determine the wearing quality of the tread, but rather, is designed to pick out any carcass weakness which may exist. It has also been the aim to set the test conditions so that a test can be run in the shortest possible time.

From results obtained up to date it appears that it will be possible to determine whether or not there is any weakness in the tire in about 1000 miles of running. This means that by operating a machine day and night a test could be completed in less than two days. The Rubber Association of America is actively cooperating with the Bureau in this work and it is anticipated that such a test will be adopted in the near future.

Power Loss Tests Outlined

In conjunction with such tests as I have outlined, power loss tests of pneumatic tires have been carried on for the past two years. Over 100 tires of various makes and of sizes ranging from 3½ to 5 in. have been tested. The equipment consists of two electric absorption dynamometers. One was operated as a motor and carried on its shaft a wheel and the tire to be tested, and the other operated as a generator and carried on its shaft a smooth, flat-faced drum. The motor is mounted on a movable carriage, the arrangement being such that the tire can be forced against the drum with a pressure corresponding to the axle load. In this way the tire and drum constitute a friction drive by means of which the motor drives the generator.

There are four principal variables which enter into the determinations aside from the tire itself—speed, tractive effort, air pressure, and axle load. The method of determining the power loss is to mount the tire on the wheel on the motor shaft and force it against the drum by means of weights acting through a bell crank lever. The axle load is varied by changing the weights. The air pressure may be changed in the usual way. In our case the tire can be inflated or deflated while running by means of a slip joint on the hub. This arrangement also aids in maintaining accurate pressures. Speed is taken care of with a variable speed motor and the tractive effort by cutting out generator resistance.

The power loss is the difference between the input to the tire by the motor and the output to the generator by the tire. It is measured by mechanical rather than electrical means, which eliminates the consideration of motor and generator efficiency, bearing friction, etc. Tests are made by running a tire under varying conditions and measuring the energy input and output under each. The difference between these figures after making a small correction for windage represents the loss in the tire. This loss is manifested by the generation of heat and a rise in the tire temperature.

Conclusions on Effect of Variables

Certain conclusions have been drawn as to the effect of each of these variables.

1. Speed—The power loss is very nearly directly proportional to the speed, that is, at 40 m.p.h. the loss is approximately twice that at 20 m.p.h. This means that the resistance which a tire offers to rolling, or what will be referred to as the rolling resistance, is very nearly independent of the speed.
2. Axle Load—The axle load has a similar effect on the power loss, unless excessive loads are used; that is, there is almost a direct proportion, and doubling the axle load doubles the loss.
3. Air Pressure—There is no simple relation between air pressure and power loss; there is an increase in power loss at low air pressures, but under high air pressures the loss approaches a constant value.
4. Tractive Effort—The introduction of a moderate tractive effort does not seem to have very much effect on the power loss. For instance, if the input to a tire is 1 hp. and the output nil, the loss is 1 hp. If there is a 5 hp. input the output will be almost 4 hp. Under higher tractive efforts the effect on the power loss is more marked.

For a simple and quick comparison tires were tested under the following conditions: (1) Zero tractive effort; (2) the air pressure as recommended by the S. A. E. for the maximum recommended load; (3) the maximum recommended axle load for each particular size tire, the loss calculated as the rate per 1000 lb. load; (4) expressing the loss as lb. rolling resistance per 1000 lb. axle load, which eliminates the item of speed.

The following figures are a summary of the rolling resistance of different kinds of tire:

TABLE 1

	Rolling Resistance per 1000 Lb. Axle Load in Lb.
3½ in. fabric tires	14 to 20
Average	17
3½ in. cord tires	8.4 to 13.8
Average	11.5
4 in. fabric tires	14 to 17.5
Average	16
4 in. cord tires	8.1 to 13.1
Average	11.3
5 in. cord tires	9 to 14.5
Average	11

It will be noted that the average rolling resistance of cord tires irrespective of the size is a little over 11 lb., while for fabric tires it lies between 16 and 17 lb. This indicates that the performance of the different sizes of tires is about the same. In round numbers, the rolling resistance of tires varies from 8 to 20 lb. per 1000 lb. load, with 14 as the dividing line between cords and fabrics.

Fabric Tires Becoming Obsolete

At the present time fabric tires are rapidly becoming obsolete, except for the smaller sizes, but taking the cord tires only, the one with the lowest rolling resistance is only 56 per cent of that of the highest. The popular idea is that these differences are due to the design of the tread. This has some influence, but it is not the deciding factor. Taking two tires, one with a smooth tread and one with a non-skid or bumpy tread, it is not possible to tell from outside appearance which will offer the most rolling resistance, although, other things being equal, the non-skid type of tire will probably show a slightly greater resistance. The real cause for differences lies in the carcass construction. While from appearances the two carcasses may be identical, small differences in the rubber compound, the lay of the cords, the amount of rubber, etc., will materially change the internal friction, and hence the rolling resistance. The fact that the carcass construction is the deciding factor is brought out by the differences between cord and fabric tires.

As a check on laboratory figures, the losses in several sets of tires have been determined in the laboratory and then the same sets put on an automobile, one after the other, and the difference in the rolling resistance determined by towing behind another car. This was carried out at various speeds and under different inflation pressures for each set of tires. While the results have not been completely compiled as yet, the differences in rolling resistance were apparent at once and the results seem to closely follow laboratory determinations.

As to the significance which may be attached to such

figures the first thing which comes to mind is the effect on fuel consumption. Comparing the effect of a change in tire equipment on fuel consumption is simply a matter of measuring the loss in each case and finding the fuel necessary to generate the excess power. The difficulty of making an accurate statement as to what this will amount to is the big variation in fuel required per horsepower, not only in different engines, but in the same engine run under different conditions. Work is being carried on at the present time to make determinations such that some fair average values may be given.

A second value which may be attached to power loss determinations is their use by the tire designer to analyze the influence of details in the tire construction. By this means it should be possible to more closely coordinate the different parts and reduce friction or wasted energy to a minimum, and at the same time prolong tire life. These investigations are being extended to solid and cushion tires. The latter tires in particular are coming into prominence at the present time, with many new kinds being put upon the market. The balloon, or air-cushion type, is also being taken up, but not enough data is yet available to draw any definite conclusions as to how the power loss compares with the usual type of tire. From the standpoint of absorbing bumps there is no question but what balloon tires are superior.

In connection with reclaimed rubber the use of a larger percentage in tire treads is being investigated. One hundred tires have been built, the tread of each consisting of sections containing different combinations of new and reclaimed rubber. These are being tested on post office cars run over roads selected with a view to giving as many varieties of road wear as possible. In addition to the direct conclusions which may be obtained from these tests, this affords an opportunity to obtain some data as to the value of the various types of laboratory abrasion machines in use. Accordingly, a complete study is being made on the rubber compounds used in the treads, using as many types of abrasion testing machines as possible. These results in connection with the road tests should give valuable information for interpreting the results of laboratory tests.

McKay Reports Important Facts on Road Financing

In his report on highway finance, McKay said:

The economic and social advantage resulting from highway improvements is now generally accepted. The transportation of freight and passengers, the opening up of new areas for agricultural production, the savings in motor vehicle operating costs, the increased values of rural and urban lands, the lowered cost of marketing agricultural produce, and the social influence of improved highway transportation, are but a few of the many far-reaching results of an improved system of highways on our national life.

The method of raising revenue to finance highway improvements is typified by a lack of uniformity among the States, an unscientific distribution of the burden between the principal sources of revenue and marked by a lack of adherence to fundamental principles of sound public financing.

The financing of highway improvements today, as well as in the future, requires relatively fixed amounts of highway revenue each year. Highway expenditures are not irregular or periodic disbursements of public funds. The financing of a State system of highways involves a continuous expenditure and not high and low periods of disbursements.

The amount of highway revenue necessary for new highway improvements decreases as a highway system as a whole approaches completion. This decrease in new construction expenditures, however, will probably be absorbed in the growing amount necessary each year for maintenance, reconstruction and betterments. The yearly highway budget represents a relatively level and continuing expenditure of public funds and the methods of producing highway revenue to meet the yearly costs must be placed on a sound financial basis which permits highway officials to plan construction and maintenance of highways over a longer period of years.

Budget System Essential

A budget system as a definite part of the highway program is essential. Under the budget system a fixed amount of highway revenue is necessary for the construction of a relatively fixed amount of new mileage each year, the balance of the revenue being used for maintenance, reconstruction and betterments.

There are six so-called sources of highway revenue which produce highway funds—property taxation, vehicle license fees, bond issues, gasoline taxes, federal aid, and a miscellaneous group such as legislative appropriations and income and inheritance taxes.

The taxation of property produces the larger share of highway revenue today as in the past. The second main source of highway funds of increasing importance are motor vehicle license fees. The practice of pledging vehicle license fees to meet the principal and interest of highway bond issues endangers the source of highway maintenance funds and usually results in diverting construction funds to maintenance. The third main source of highway revenue is from the sale of highway bonds.

Highway bonds are credit instruments sold to make highway funds immediately available and are not in themselves a source of highway revenue. Real property taxation and vehicle license fees when pledged to meet the principal and interest of highway bonds are the true source of funds obtained through the sale of bonds. Gasoline taxation is a fourth method of raising funds that is now being used as a source of revenue by a considerable number of States and its importance is steadily increasing. Federal aid is a fifth source of highway funds. The sixth or miscellaneous group is not as important as the preceding ones and produces a relatively small part of the total amount of highway funds. The primary sources of highway revenue are as follows:

1. Property taxation.
2. Vehicle license fees.
3. Gasoline taxation.

As a general rule, States rely upon a combination of property taxation, vehicle fees, and in a number of States gasoline taxation, to produce highway funds. The sale of highway bonds is a common practice of both State and county units. It is not, however, a source of highway revenue. The true source of highway bond funds is that revenue which is pledged to meet the payment of the bond principal and interest.

The principal criticism of present methods of raising highway revenue is that the per cent of the revenue raised from property and from the highway user is not based on the benefits received by either source of revenue from the highway improvement or on the ability of either source to contribute to the improvement. In those States where real property provides the larger share of highway funds there is an unfair burden on property which does not benefit in proportion to the amount of taxation.

On the other hand, it is unfair to tax the highway user beyond the actual value of the highway service rendered. Between these two extremes there is a middle ground of highway financing which can produce revenue equitably from both sources.

The second major criticism of modern highway finance methods is the use of credit in highway improvement programs. The excessive use of State or county credit is dangerous. If a State can carry on a normal highway improvement program without resort to the sale of highway bonds it is a sounder and less costly method of financing.

Any plan of State or county highway financing should conform as closely as local conditions permit to the fundamental rules which govern the raising of public revenue. (1) An equitable distribution of the burden between the contributing sources according to the benefit derived from the improvement and the differences in the ability to pay for the improvement. (2) Provide a definite amount of highway revenue yearly. This implies the highway budget system.

Yearly Program Uneconomic

The highway program of a State should be limited to the ability of the State to economically carry on a long-time improvement program. It is economically unsound to set as an objective the completion of a large yearly program of new construction as a mark of achievement. The result of this practice is to unduly increase the demand for labor and materials above normal which increases the per mile cost of highway improvement.

Two distinct problems are involved in discussing the financing of highway improvements. (1) An equitable distribution of the cost of highway improvements among the several sources of highway revenue. (2) Whether or not the use of credit is necessary in financing highway improvements by the sale of bonds. The theory underlying bonding is twofold. (a) To make immediately available a large amount of revenue and (b) to shift a share of present improvement costs to future generations which benefit from the improvement.

The answer to the first major problem is found largely in an analysis of the benefits accruing to the several sources of revenue from the highway improvement. The answer to the second major problem depends largely upon the ability of the present sources of revenue to provide sufficient current funds to complete the highway system without unduly burdening the sources of revenue.

It should be emphasized that the use of credit, which in my judgment is second in importance to the problem of equitable distribution of the costs, *does not solve the problem of distributing the highway costs between the several sources of revenue.* The same sources of revenue which finance highway improvements when credit is not used must also provide the revenue to meet highway bonds when funds are borrowed. Usually real property furnishes the revenue to amortize the bonds.

The fundamental problem is to determine the type of financing necessary in any given State to produce sufficient highway revenue to carry out a normal highway improvement program.

Physical Improvement Is Asset

The physical part of the highway improvement is an asset that remains in existence over a period of years and may be called the permanent investment. The larger the amount of permanent highway investment in existence in a State the less the real need for the use of credit in financing the improvements. This situation is more the case in the older States whose road systems are well defined and a considerable portion of their highway mileage completed. The second factor in determining whether to use present sources of revenue or make use of credit depends upon the wealth of a State and the ability to produce highway revenue from this wealth without unduly burdening it or decreasing the revenue raised for purposes other than highway improvements.

In order to justify the construction of a highway with funds raised from the taxation of real property, the benefit to the property must at least equal the burden. Both the burden and the benefit will be reflected in land values. If the benefit is the larger, land values will increase; if the burden is greater than the benefit, land values will decrease. In this way we can arrive at a maximum above which taxation of real property for highway improvements is unjustifiable.

The benefit to the user of the road can be measured by the amount he is willing to pay for this use, the maximum being the highest possible rate which will not result in a restriction of traffic. The benefit to the general public is much harder to measure; we meet here the difficulty which the benefit theory of general taxation has constantly encountered.

It is safe to say that the benefit to the general public after excluding the general as well as the special benefit to the user of the road and the land owner is a comparatively small part of the total benefit. Our problem then, resolves itself largely into the question of a just distribution between the burden on land and the burden on the highway user. The benefit to land must be determined by a study of the effect of various types of highway improvements on land values; the benefit to the user must be determined by a study of the value of the service.

Study of Revenue Sources

Before making any decision as to the justice or expediency of the methods of highway financing, it is necessary to make a complete study of the sources of highway revenue, local, County, and State, in typical States. Most of the previous investigations have been limited to a study of the sources of State revenue for highway purposes and have disregarded the County and local expenditures for highway construction and maintenance. The following results are based on an analysis of all sources of revenue and expenditures in four Wisconsin Counties from 1915-1921.

Wisconsin was selected as a State whose system of highway financing represents a fair average of methods of raising highway revenues in other States. Four Wisconsin Counties, Dane, Outagamie, Rusk and Waukesha, were chosen for the purpose of determining the percentage of revenue for highway purposes which is provided by each of the several sources of revenue. These counties were selected as typical counties representing the highway development in different sections of the State.

The conclusions based on analysis of the sources and expenditure of highway funds in these four representative Wisconsin counties follow:

1. The major portion of the total of highway funds in Wisconsin during the seven-year period from 1915-1921 were raised by township and county units rather than by the State.
2. Real property taxation was the chief source of highway revenue producing an average of 62.17% of the total local county and state highway expenditures.
3. Vehicle license fees produce 8.84% of the total highway expenditures.
4. Real property taxation for highway purposes bears too large a portion of the burden of highway expenditures producing from 55% to 70% of the total highway revenue.

5. The major portion of the burden on real property is due to local and county taxation of real property for highway purposes. The local units produce 47.49%; county units 41.81%, and the State 10.70% of the real property revenue for highway expenditures.
6. Real property contributes a larger share of highway revenue during periods of depression, when the revenue from other sources decreases. This results in an excessive levy on real property owners since the tax levy on real property is paid from income derived from the property and in periods of low prices this income is reduced at least as much as income from other sources.
7. When income tax funds increase within a county, real property taxation for highway purposes decreases.
8. As a county develops and grows richer the relative burden on real property for highway purposes decreases. When a county or State is in the developmental stage the cost of the permanent features of highway improvements can be economically financed by issuing a limited amount of deferred serial highway bonds. By this method the burden on property is lightened during the early years of the improvement, increasing with the ability of property to produce more revenue as a result of the highway improvements.
9. A reduction or elimination of state taxation of real property for highway purposes in Wisconsin would not materially reduce the total of real property taxation for all highway purposes.
10. Reduction of real property taxation for highway purposes in Wisconsin would result largely in a reduction of local and county taxation of real property for township and county highway expenditures.

The two logical sources of highway revenue are real property taxation and vehicle license and gasoline taxation. When real property taxation produces too large a share of highway revenue in comparison with the share produced by vehicle license and gasoline taxation there are three courses which may be followed:

1. The elimination of inefficiency and waste in the expenditure of highway funds by the local and county units. Eighty-nine and three-tenths per cent of all real property tax funds for highway expenditures are raised by the local and county units. Any reduction in expenditures by eliminating the waste of highway funds will result in a reduction of the burden on real property for highway expenditures. This may be accomplished as follows: (1) Provide for strict supervision by the State Highway Department over the construction and maintenance of purely county highways. (2) Provide for close supervision by the county units over township highway expenditures, possibly limiting the maximum expenditures by the local units for highway expenditures to a fixed percentage of the township property valuation.

2. A reduction in the total yearly highway expenditures—township, county and State. It is obvious that the present county and State expenditures for highway improvements lag behind the need for improved highways and is not a desirable solution of the problem.

3. Shift part of the burden of highway improvements from real property to other sources of revenue.

A reduction in the amount of highway improvement revenue raised from the taxation of real property without raising a like amount from some other source of revenue would result in a reduction of the total highway funds below a necessary minimum. The logical solution is to increase the total revenue raised from old, or create new sources of revenue for highway improvement to replace the revenue lost by the lowered taxation of real property. The source of this increased revenue is the highway user whose demand for highway service is largely responsible for highway improvements.

Good Roads Interest Developing in Argentina

DURING February of this year the firm of George B. Nolan, Inc., of New York offered to provide the funds and to construct for the Province of Buenos Aires a total of 10,000 kilometers of roads. Of these roads 200 kilometers were to be built of concrete at a cost of $10,000 Argentine paper per kilometer, 800 kilometers of macadamized road at $9,000, 2500 kilometers of sand and clay roads at $3,000 per kilometer, and 6500 kilometers of improved dirt roads at $1,000 per kilometer.

At the time this proposal was presented the Governor named a commission of engineers to study the proposal both in its technical and financial aspects. This commission, in order to make its report, was obliged to study the conditions of the province carefully for the purpose of determining where the proposed roads should be laid out.

Up to September high hopes were entertained that this proposal of the Nolan firm would be accepted by the provincial authorities, especially so since the proposers offered to furnish the necessary capital of $20,000,000 U. S. currency. However, the Government at La Plata has now definitely rejected the offer.

On the other hand, the Governor in a message to the provincial Legislature has requested authorization to issue road bonds up to a total of $50,000,000 Argentine gold for constructing 9080 kilometers of roads, of which 177 kilometers are to be of concrete, 836 macadamized, 1870 of sand and clay, and 6197 of dirt. The Governor's plan also provides for a complete revision of existing taxation on real estate property throughout the entire province in order to meet interest and amortization on this issue. In case this measure goes through the roads will be built by the Government itself and the bonds issued in series in accordance with the requirements for meeting expenses.

The Department of Public Works of the Province of Cordoba has been authorized by the provincial Legislature to contract for 17 complete road building outfits at a total cost of $142,800 Argentine paper. Each of these outfits is to be made of one Oil-Pull tractor, 12-20 hp.; one three-bottom Deere plow and an 8-ft. Champion grader, together with all the most essential spare parts.

The Provinces of Santa Fe and Cordoba, now engaged in the construction of the Mitre Highway from Rosario to the City of Cordoba, are much interested in securing the support of the Province of Buenos Aires in constructing a highway from the City of Buenos Aires to Rosario. This initiative is meeting with the enthusiastic support of the Argentine Touring Club and it is hoped that during the coming summer automobile enthusiasts can count on a first class automobile highway from Buenos Aires to Cordoba.

Another important initiative of the Argentine Touring Club is the work in favor of building an automobile highway from San Rafael in the Province of Mendoza to El Sosneado in Chile, a road leading over the Andes Mountains. The proposed route has already been surveyed, and although the distance is something over 230 kilometers yet there are only 40 kilometers where any serious difficulties would be met with.

Exports of Cars, Trucks and Tires for

COUNTRIES	GASOLINE PASSENGER CARS								GASOLINE TRUCKS					
	Up to $500		$500 to $800		$800 to $2000		Over $2000		Up to 1 ton incl.		1 to 2½ tons		Over 2½ tons	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Europe														
Austria			3	$1,947	2	$1,808								
Azores and Madeira Islands	7	$2,210							1	$364				
Belgium	498	156,625	21	11,643	40	42,822	3	$9,524	236	58,537				
Bulgaria														
Czechoslovakia	3	650			1	930								
Denmark	13	5,526	54	42,026	32	34,826	2	7,341	2	1,062	1	$1,277		
Esthonia														
Finland									2	1,950				
France	1	408	2	1,280	2	1,856	1	2,500						
Germany					2	3,046			1	425				
Greece			2	1,574	11	9,712								
Hungary														
Iceland and Faroe Islands														
Italy	130	37,957	10	5,073			2	7,136	20	5,351				
Latvia			1	654										
Lithuania							1	2,692						
Malta, Gozo and Cyprus					2	2,406								
Netherlands	7	2,887	13	9,618	58	63,645	2	5,525						
Norway	1	400	10	5,050	18	17,857					3	5,100		
Poland and Danzig			1	716	2	1,798								
Portugal			1	766	3	4,138	2	4,200						
Rumania			10	5,332	3	3,734	1	2,692						
Russia					1	1,500	3	8,282						
Spain	104	48,216	417	235,578	348	372,489	15	39,574					4	$4,600
Sweden	71	27,893	100	63,444	107	114,801	5	11,707	9	10,371				
Switzerland					5	4,962	1	4,600						
Turkey														
England	52	18,294	112	74,213	129	129,671	1	7,400	15	9,074	79	62,243		
Scotland					1	1,600								
Ireland	4	1,065	2	1,450			1	3,152						
North and South America														
United States														
Canada	114	35,563	855	511,095	405	439,903	54	153,785	27	14,356	39	46,736	13	54,157
British Honduras	2	454												
Costa Rica					2	1,624								
Guatemala	2	962			6	7,385								
Honduras	6	2,285			2	1,919								
Nicaragua			3	2,148	1	1,372								
Panama	9	3,163	5	3,166	23	25,618					2	8,250		
Salvador			3	1,805	3	2,752								
Mexico	342	120,035	69	42,912	85	96,023	4	13,010	100	38,714	12	21,210	3	7,168
Miquelon, Langley and St. Pierre					1	1,600								
Newfoundland and Labrador	2	448			3	3,489								
Barbados	2	748			3	2,859								
Jamaica	16	6,297	20	14,256	14	15,005			23	8,382	2	4,198		
Trinidad and Tobago	11	3,744	4	2,864	1	857			5	1,820				
Other British West Indies	11	4,340	3	2,187	3	3,763			3	1,148				
Cuba	245	71,563	60	42,986	71	78,096	11	30,439	48	15,956	3	4,275	1	1,792
Dominican Republic	40	12,877	10	6,086	16	18,485	1	2,678						
Dutch West Indies	10	2,950	1	600	1	1,042			2	782	1	100		
French West Indies	2	748												
Haiti	1	408	10	7,361	8	8,470								
Virgin Islands			1	741	1	988								
Argentina	273	122,927	186	123,278	126	131,156	8	27,740	31	31,990	8	17,300		
Bolivia	1	351	2	1,437	4	4,728								
Brazil	13	4,940	21	15,693	67	72,525	2	7,362						
Chile	61	18,941	8	5,160	30	34,721	1	3,369	65	36,978	3	3,000	2	6,650
Colombia	16	6,167	4	2,702	11	12,639	1	2,681	6	1,962	1	1,129		
Ecuador	6	2,470							5	1,704				
British Guiana	2	597												
Dutch Guiana														
French Guiana														
Peru	84	31,574	1	766	6	5,964	1	2,786	36	13,246	1	2,800	1	2,800
Uruguay	223	62,645	34	20,087	36	44,410	5	19,260	51	14,593				
Venezuela	26	9,531	7	5,180	16	15,744	2	5,548	22	8,008	1	1,500		
Asia														
Aden	4	2,000			1	1,250								
British India	82	36,729	100	65,103	77	74,062					8	9,459		
Ceylon	5	2,405	17	10,033	16	16,403			1	995	4	5,601		
Straits Settlements			26	19,432	15	14,636								
Other British East Indies														
China	12	5,384	39	28,233	19	21,909	5	17,712	3	1,092	3	8,094	1	950
Chosen			3	2,050										
Java and Madura	5	2,300			84	84,324								
Other Dutch East Indies			1	531	3	2,840								
French Indo China														
Hejaz, Arabia and Mesopotamia	14	3,987			5	4,344								
Hongkong	12	4,670	2	1,147	4	3,520	2	7,000	10	5,000				
Japan	6	2,652	47	31,053	58	61,275	5	14,669	3	1,500	59	79,405	2	9,918
Kwantung	1	250												
Palestine and Syria	5	1,900	5	3,580	15	15,350	4	8,712						
Persia	65	17,926												
Philippine Islands	1	400	10	7,505	42	56,772								
Siam					4	3,248								
Turkey	6	1,676												
Oceania														
Australia	543	181,957	957	634,647	1,064	1,090,396	31	73,055	67	81,261	53	79,218	6	12,254
British Oceania			3	2,148										
French Oceania	2	700												
New Zealand	16	7,309	81	58,560	143	159,781	2	6,113	24	30,275	14	25,081	1	3,600
Other Oceania	1	400			1	1,095								
Africa														
Belgian Congo									8	2,912				
British West Africa			6	4,371	6	6,162			24	21,240	17	19,129		
British South Africa	52	23,357	72	53,286	231	231,845	1	2,214	6	3,350				
British East Africa	15	6,882			8	7,925								
Canary Islands	2	749	3	2,148	5	6,325			8	3,360				
Egypt	9	4,154	10	5,566					2	924				
Algeria and Tunis	12	3,910												
Other French Africa	7	2,442							3	996	1	1,027		
Italian Africa														
Morocco	22	8,138							2	840				
Portuguese East Africa	1	497			1	1,000								
Other Portuguese Africa	7	3,014			3	2,850			5	1,925				
Spanish Africa			3	2,148										
Total	3,318	$1,154,647	3,451	$2,204,415	3,517	$3,712,050	180	$514,458	876	$432,443	315	$406,132	34	$103,389

eptember, 1923 Canadian Exports

PARTS	TIRES						PASSENGER CARS		TRUCKS		PARTS	COUNTRIES
	Casings		Solid		Inner							
Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	Value	
												Europe
$250	15	$312										Austria
125	10	220			10	$30						Azores and Madeira Islands
100,987	201	3,964			152	399	20	$15,830				Belgium
	83	1,110	6	$129	142	253						Bulgaria
580	2	50										Czechoslovakia
64,097	4,844	54,821	109	2,755	4,867	6,422	4	1,951			$10,908	Denmark
207												Esthonia
1,548	441	6,470	10	270	591	1,073						Finland
232,994												France
909	34	489			10	14						Germany
1,395	315	4,102	74	1,659	117	280						Greece
	65	1,131										Hungary
253	40	440			189	284						Iceland and Faroe Islands
12,532	1,132	11,372			238	453						Italy
721												Latvia
												Lithuania
240	120	1,122			106	169	3	1,496				Malta, Gozo and Cyprus
26,784	1,597	19,937	9	216	1,749	3,496	5	4,095			248	Netherlands
15,409	369	5,951	41	1,380	286	643	4	3,039				Norway
17,012	35	356	2	62	60	109	5	3,828				Poland and Danzig
1,923	75	1,202			165	264						Portugal
47	200	3,526			248	577						Rumania
7,441	50	1,435	418	10,832	250	740						Russia
369,960	2,975	52,446	398	14,742	3,232	6,513	2	968			6,950	Spain
65,883	2,736	33,638	85	2,852	2,686	3,921	68	59,287			89	Sweden
3,776	71	3,894			175	598	3	1,512				Switzerland
648	65	666			40	68						Turkey
220,050	6,550	65,233	4,091	81,367	2,371	3,844	932	621,856	422	181,457	22,274	England
198	100	1,079	49	1,708	28	39						Scotland
96,827	190	2,114			198	291						Ireland
							21	6,700	3	$495	32,329	North and South America
2,131,390	2,777	31,839	79	4,367	3,326	6,350						United States
562	12	79	2	30	2	10						Canada
1,428	56	776			52	85	2	1,633				British Honduras
2,521	66	1,149			94	239	3	2,534				Costa Rica
3,269	46	840	26	769	41	57						Guatemala
36	40	489			49	74						Honduras
11,587	696	6,682	41	521	120	244						Nicaragua
1,984	187	3,762	10	288	508	1,117	1	851				Panama
81,028	6,588	68,874	118	3,703	4,533	7,581	21	21,256				Salvador
												Mexico
821	130	1,808			125	226	6	2,010			17	Miquelon, Langley and St. Pierre
1,730	20	115	10	179			2	2,640			1,720	Newfoundland and Labrador
13,347	347	5,198	23	305	187	466	1	851				Barbados
3,632	125	1,581			130	261						Jamaica
2,515	181	1,638			277	375	1	464				Trinidad and Tobago
76,705	9,806	95,202	420	12,874	5,184	8,271	19	17,106			18	Other British West Indies
16,438	1,878	22,001	19	419	2,571	4,656	3	3,396				Cuba
1,552	36	427			72	137			12	3,734		Dominican Republic
1,379	58	529										Dutch West Indies
4,672	179	2,401			211	358						French West Indies
422	53	640			63	113						Haiti
733,930	14,278	155,174	58	1,374	8,576	13,803	176	108,053			17,315	Virgin Islands
1,572	30	505			61	168	3	3,759				Argentina
211,399	861	11,366	21	509	785	1,163	3	2,945			15,365	Bolivia
22,788	1,148	13,646	4	114	533	1,174	3	2,814			39	Brazil
18,021	400	5,969			482	720					45	Chile
1,500	74	865			48	73						Colombia
2,222	22	206			12	17	5	2,904				Ecuador
101												British Guiana
324												Dutch Guiana
12,688	999	13,371	54	822	1,052	1,875	3	4,048				French Guiana
8,356	1,401	17,369			1,644	2,815	33	21,106				Peru
8,594	850	9,337	18	407	1,268	2,113	6	7,398				Uruguay
												Venezuela
416	308	2,811			103	177	5	1,442			235	Asia
25,689	1,197	10,088	237	5,976	1,295	2,135	491	234,707	58	19,372	8,061	Aden
2,637			24	741			43	18,169	16	5,344		British India
25,697	42	571	31	713	36	69	123	47,511	12	4,008	3,932	Ceylon
54												Straits Settlements
5,009	1,330	11,297	46	1,001	1,929	2,237	10	8,220				Other British East Indies
10,400	438	5,036										China
15,520	840	11,025	43	1,380	735	1,450						Chosen
2,005	54	844	8	170			153	55,558			9,774	Java and Madura
212												Other Dutch East Indies
1,413	142	1,416			150	204						French Indo China
1,151	116	1,655	8	110	117	262	2	1,025				Hejaz, Arabia and Mesopotamia
84,972	1,514	15,155	65	1,071	931	1,555	35	19,273				Hongkong
332												Japan
7,274	630	6,610			524	791						Kwantung
	27	269	20	287	19	34						Palestine and Syria
26,134	1,945	25,831	320	6,715	1,622	2,991						Persia
86	45	468			40	50	10	2,765	14	4,676	1,786	Philippine Islands
91												Siam
												Turkey
335,169	3,471	48,014	786	22,187	2,028	3,756	1,330	428,014	547	190,064	62,897	Oceania
406	9	79			12	17			2	668		Australia
698	32	343	4	152	22	37						British Oceania
77,837	4,969	61,552	517	21,850	1,536	4,056	890	446,817	138	49,160	30,767	French Oceania
76	15	183			30	54						New Zealand
												Other Oceania
3,287	6	116			38	100						Africa
7,838	735	11,142			502	1,071	16	5,663			1,100	Belgian Congo
57,337	1,489	17,076	8	167	2,462	3,911	612	273,496	23	7,682	11,823	British West Africa
3,090	385	4,764	1	94	272	711	3	1,377	10	3,340	2,092	British South Africa
4,235	520	5,969	46	1,137	214	304						British East Africa
3,760	424	4,281	4	70	341	1,594	12	6,760				Canary Islands
			5	511								Egypt
3,471												Algeria and Tunis
354												Other French Africa
16,186												Italian Africa
1,326												Morocco
1,709	20	382			20	47	1	1,224				Portuguese East Africa
940												Other Portuguese Africa
												Spanish Africa
$5,348,189	86,362	$997,895	8,368	$208,985	64,894	$112,634	5,095	$2,478,346	1,257	$470,000	$239,809	Total

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Sell Intensively in the South

MORE than a year ago after a careful survey of the South, AUTOMOTIVE INDUSTRIES advised manufacturers of automotive products to cultivate that section assiduously as a market. Those who went after sales intensively have profited and they will continue to profit. High prices promise to more than counteract the effect of a short cotton crop and the South is undeniably prosperous. It has enormous purchasing power and it will continue to buy on a large scale for an indefinite period.

This prosperity is a factor to be reckoned with by all manufacturers. Cotton planters now have substantial bank balances which will last for another year. The next crop is bound to be profitable. If it is large, the demand will be large enough to insure its sale, and another short crop will bring still higher prices.

While cotton still is king in the Southern States it is by no means the sole source of wealth. The past few years have brought an amazing industrial development which is not likely to be arrested for some time to come. There is greater room for growth in this direction than in the older industrial sections. Those who neglect sales effort in the South, therefore, will be overlooking what is today one of the most prosperous portions of the United States.

While the South is in a better position to buy than other agricultural areas, it is gratifying to note gradually improving conditions in all farming sections. The worst is over for farmers and sales to them for the next few months are likely to show relatively greater gains than in industrial centers, where purchasing power probably will remain more or less stationary.

Coolidge and Congress

BUSINESS men as well as politicians are speculating with avidity on the probable contents of President Coolidge's first message to Congress. Up to this time he has concealed rather successfully his views on various public questions, and it is the expectation that he will declare himself on some of them which has provoked so much interest in what he will say to the nation's Solons.

Most observers consider it practically certain that he will discuss taxation, transportation and immigration as the three major domestic problems. He is likely, also, to give some consideration to foreign relations. Obviously, all these subjects are of direct or indirect importance to the automotive industry, with transportation taking first rank.

Speculation concerning what Mr. Coolidge will say is futile.

Whatever concrete recommendations he makes will be given respectful consideration, but Congress will be exceedingly wary. It will produce a great deal of conversation, oratory and adjectives, but not much action. The eyes of members will be directed more often on political expediency than on the needs of the country, for Presidential candidates will be nominated next June.

"Radicals," such as Magnus Johnson, will rant, but practical politicians are not likely to permit action on any important legislation which might have an adverse effect on votes. That is the main reason why there is little probability of Secretary Mellon's proposal for reduced taxation being adopted. Those who would not benefit materially are much more numerous than those who would.

By the same token, political considerations make the probability of bonus legislation the more menacing. Veterans of the World War make up a force to be reckoned with. Neither party is likely to antagonize them on the eve of a Presidential election if it can be avoided.

"All for One and One for All"

A MARKED change has taken place in the attitude of factories toward dealers in the last two years. The idea of building up a strong retail organization on a basis of mutual cooperation has been gaining ground steadily. Manufacturers who two years ago were laying down the law to their dealers in no uncertain terms are today working constructively with

their distributors and retailers in an effort to develop forceful and economical sales methods.

One prominent manufacturer goes so far as to say in an advertisement written for dealers:

"Show me a factory that will take a chance on losing a single dealer nowadays." The statement is made in connection with a plea to dealers in low-priced lines not to be afraid of the factory's displeasure if they should take on a higher priced line as well.

To say that no factory will take a chance of losing a single dealer is undoubtedly an exaggeration, but the definite statement referred to serves to emphasize a general trend in manufacturer-dealer relationships.

The best dealer in the long run is the one who has initiative, selling ability, financial standing, and a desire to give good service. Men of this kind almost always have an independence of spirit which is a natural concomitant of the qualities mentioned. It may be difficult to get a group of this kind to obey factory edicts without question, but it will furnish an impetus to sales greater than could be expected from the type of dealer who devotes his entire time to trying to carry out ideas generated by somebody else.

R. H. Grant, speaking about factory management at the recent S. A. E. production meeting, brought out clearly that the day of autocratic management has passed. He showed that the plant in which a single all-wise head directs, checks, and urges, while department chiefs concentrate solely on the problems of their own division, is no longer the most efficient. It would seem that these same principles apply equally well to selling organizations.

Why Loose Rivets in Engine Supports?

MANY service men are troubled continually by loose engine support brackets caused, it is assumed, by loose rivets. There would seem to be no good excuse for such brackets coming loose, but we are told that it is not uncommon to find engines with as much as ¼ in. vertical play after a few months service. This, of course, results in misalignment and much noise in operation over rough roads and is far from good for the engine.

Only a small percentage of repairshops are fitted to do a good and economical job of hot or even cold riveting. Consequently it is common practice to drill or ream out the rivet holes to the next larger size of standard bolt and use such bolts with heavy lock washers in place of rivets. When this is done it is claimed that no further loosening occurs.

There would seem to be two logical remedies for the factory to apply in the first instance, either of which should prevent this trouble. One is to use rivets of adequate size and proper material, carefully driven, and the second is to employ bolts, also of good size and good material, which are fitted correctly.

It seems probable that part of the present trouble results from too small and too soft rivets, which are not fitted correctly to begin with. It is conceded, in general, that hot riveting is productive of the best results, but some experienced men in riveting work are inclined to doubt that this is the case. They contend that a rivet which is driven hot should, and probably does, fill the hole while it is still hot, but that it contracts away from the hole when it cools and thus permits of play which soon results in wear.

In support of this contention instances are cited in which rivets driven cold have proven better than others driven hot. Of course, the cold rivet, too, must fit the hole closely and must be of correct material. It must be headed, also, with blows of proper weight. When this is done rivets up to 1 in. or more in diameter are cold driven satisfactorily.

We hold no brief either for hot or for cold riveting. Doubtless either method can be used with success if care is used to do the work well with properly selected materials. Both methods deserve close study and control to secure best results.

Constructive Work Deserves Praise

AUTOMOTIVE INDUSTRIES extends its sincere congratulations to A. H. Swayne and his associates on the committee which formulated the intensely interesting report, printed elsewhere in this issue, clarifying the position the motor vehicle should fill in the field of transportation. It bespeaks not only intensive study and careful consideration of the public welfare, but diplomacy of a high order.

When the work was undertaken it was necessary to reconcile a variety of conflicting views. Representatives of steam and electric railroads had behind them traditions of antagonism toward highway transport which most of their fellows always had looked upon as an interloper in the family without economic justification. The task was undertaken with an open mind, however, and study of the facts disclosed that cooperation would produce greater dividends as well as provide an infinitely better service for shippers.

The fact that old antagonisms were not permitted to interfere with constructive effort and that there was entire unanimity in the report which finally was formulated is a tribute to the high calibre of the men who composed the committee. Representatives of the automotive industry knew that they stood on firm ground and their thorough grasp of the economics of the situation aroused the admiration of their confrères. This knowledge, plus clear vision and broad-mindedness, soon made is certain that when the report was completed it would merely reaffirm the principles already enunciated by the industry.

The forbearance displayed for the last three years by automotive leaders in the face of wanton attacks by railroad interests has been justified. The wisdom of calm conference has been demonstrated and a more cordial feeling exists today than ever before. Those who are responsible for the motor vehicle have held out the olive branch of peace. If it is not finally accepted, so that there can be unified and determined effort for more efficient transportation, it will not be their fault.

Production So Far Placed at 3,389,982

With Two Months Yet to Go This Year It Is Possible Output May Be 4,000,000

NEW YORK, Nov. 12.—The automotive industry swung back into its spring and early summer pace last month with an estimated output of 361,000 cars and trucks. This exceeded the marks of the three preceding months and was topped only by April, May and June of this year. It was 122,000 greater than the total production in October last year. The number of cars and trucks produced during the ten months of this year is several hundred thousand over the three million mark, the aggregate being 3,389,982.

Production in November of last year amounted to 237,201, which was 2000 less than that of the month before. December output dropped to 228,252. These totals will be exceeded in substantial amount this year.

Major producers, operating on high schedules during October, will curtail programs somewhat this month, due to plant readjustments, inventory taking or the customary slackening in sales. Similar conditions will produce a like effect in December, although in both months some output will be turned over to dealers for stocking or warehoused, in anticipation of an active spring demand.

Spotty Conditions in Sales

Sales conditions continue spotty, but the situation is satisfactory, and is far better than it was a year ago. Such decline as is being experienced is to be expected, and that it is no greater is an extraordinary feature of a momentous year in the industry both from a sales and production standpoint. There are very few distributing centers reporting a marked decline, and in most instances the indications are that this will be overcome to a certain extent this month. Weather conditions and crop returns will prove important factors in the keeping of sales to a relatively high level in November.

Moving of output from factories to distributors has been effected with little difficulty, carload shipments in October totaling 41,700, as against 36,885 in the preceding month and 26,980 in October last year. More cars, likewise, were delivered by driveaways and boats than in the month before. Winter weather, however, will affect deliveries by both the latter methods, but it is felt that with the present satisfactory rail equipment, factory output will be moved readily in the succeeding months.

Operations in truck producing factories are moving forward, and parts makers report plants actively engaged. Bus chassis are being turned out in increasing volume by truck manufacturers, with a consequent maintenance of body building schedules at a high point.

Although the various branches of the industry will not operate at record-breaking levels during November, they will make new high marks for the month.

Business in Brief

NEW YORK, Nov. 12—A general survey reveals an upswing in certain sections of the country's business. Otherwise there is a rather spotty condition.

Car loadings remain at a high point. The week ending Oct. 27 recorded a total of 1,073,965 cars, an increase of 1084 cars over the week previous. It is doubtful whether this high figure will be reached again with the advent of winter weather.

The steel industry continues to show a steady and marked decline. Unfilled orders show a falling off of 7.2 per cent from the total at the end of September. Buying remains quiet with little evidence of consumers stocking up for the future. Expectations are for heavy buying next year by the railroads and continued demand for structural material from Japan.

Building permits and value of building contracts have shown a large increase in October. Lowered prices of building materials are thought partly responsible and in some quarters there is apprehension of an unsound building boom in the spring of 1924.

Crop conditions continue favorable. Cotton prices have risen and grain prices have been pretty well maintained. Foreign demand for grains is weak owing, among other factors, to continued unsettled conditions abroad.

The stock market has shown a steady upward trend with no apparent reactions in sight. The volume of shares traded has in some instances doubled, indicating the quick response to the upward movement on the part of the public. The bond market has shown a great display of strength and gains have been well distributed. New issues have appeared with the better tone.

Still Seek Standard Balloon Tire Sizes

No Agreement by Company Executives—Compromise Waits on Car Makers

AKRON, OHIO, Nov. 12—Executives who attended an informal meeting of tire company representatives here last week failed to reach an agreement in reference to standard balloon size tires, although most of those present were willing to meet any reasonable compromise that would be generally satisfactory to automobile manufacturers.

Firestone representatives were much in favor of a quite narrow 20 in. rim, such as this company has advocated from the start, while Goodyear preferred a somewhat wider 22 in. rim, which, it is said, is demanded by some of its largest customers.

Compromise Was Suggested

It was then suggested that a compromise be made through the adoption of a 21 in. rim, but it was held that this, too, would be unacceptable to many automobile makers.

From this it appears that passenger car builders hold the key to the situation and that, having failed to come to any agreement among themselves, tire companies will be called upon to make a variety of sizes, including both 20 and 22 in., rim diameters and possibly also 21 in. This, of course, affects also both the rim and the wheel manufacturers as well as the tire companies, and makes it probable that tooling costs for the multiplicity of sizes of tires, rims and wheels will run into a large sum.

In reply to claims that automobile engineers and executives have failed to agree on tire standards, it is asserted that the Society of Automotive Engineers, through which automobile concerns usually function when it comes to creating standards, has long sought closer cooperation with the Tire and Rim Association in respect to tire standardization.

S. A. E. May Act Alone

It is understood that the S. A. E. recently went on record to the effect that, if the Tire and Rim Association does not soon extend the cooperation desired, it (the S. A. E.) will be compelled to proceed alone.

Now comes the official announcement that the Michelin Tire Co. will market a line of balloon tires, termed low pressure "comfort" cords, made especially for and interchangeable on present standard rims.

It is assumed that other tire companies will follow suit, although it is understood that discussion of a proposal to bring out a line of balloon tires for

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Maxwell Not to Retire Notes by Bond Issue

Refunding Program Deemed Inadvisable Because of Present Bond Market

DETROIT, Nov. 13—Maxwell Motor Co. has called off its plans for refunding present outstanding notes by a bond issue and will retire them as they mature in the coming year from earnings. This change in plans has been brought about, according to President W. R. Wilson, by present unfavorable conditions in the bond market, making a refunding program inadvisable.

The company will proceed with its program for the development of its Maxwell and Chalmers properties as if the bond issue had not been contemplated, Wilson said. Setting forth the reasons why the company had planned an issue of about $5,000,000 in bonds, Wilson said the financing program at the reorganization of Maxwell had not taken into consideration the purchase outright of the Chalmers company.

This purchase and subsequent rehabilitation of Chalmers had imposed somewhat on Maxwell finances, causing the company to consider a bond issue, both as a means of aiding in the financing of Chalmers and for the retirement of present outstanding notes.

The company also plans the installation of much new equipment both at the Maxwell and Chalmers plants, equipment designed to increase the output at both plants considerably beyond present facilities. These changes are now being made.

The company has ample finances to proceed with its plans, Wilson said. The liquid assets of the company are large, and it has plenty of working capital. By the issuance of the now abandoned bonds it would have been given an added amount of financial leeway than is now the case, but the company has ample funds for its need, Wilson declared.

Star Rebound Controller Sold to American Bosch

SPRINGFIELD, MASS., Nov. 15—The American Bosch Magneto Corp. has purchased the Star Rebound Controller Co. of Cleveland, and the device is now being offered as an American Bosch product.

The controller will be sold through the American Bosch sales organization, as well as the Star field force, which has been taken over.

Present plans provide for the manufacture of the controller in this city, either in the present plant of the American Bosch corporation, or in a separate plant. Production will approximate 500 controllers daily.

YELLOW TO BUILD IN CANADA

CHICAGO, Nov. 15—Yellow Cab interests are reported to be making plans for the organization of a company to be known as the Canadian Yellow Cab Manufacturing Co., Ltd., which proposes to erect a plant in the Dominion to supply the demand for cabs throughout Canada.

BOCK TO ACQUIRE COMMON

TOLEDO, Nov. 14—Toledo interests now in control of the Bock Bearing Co., here, plan to acquire common stock from the receiver of the Standard Parts Co. within the next month.

Next Year Will Be Good One With Automotive Industry Despite Presidential Elections

AN INTERVIEW WITH W. R. WILSON,
President of the Maxwell Motor Corp.

By D. M. McDonald,
Detroit News Representative of the Class Journal Co.

Detroit, Nov. 14.

MAXWELL Motor Corp. is reorganizing its factory facilities not only for a continuance in 1924 of the heavy manufacturing operations of this year, but for a considerably increased schedule, an increase which President W. R. Wilson sees fully justified by the indicated automotive market of next year.

This is perhaps his best answer to the question of what might be in store for the industry in the forthcoming presidential year. In preparing for next year's business the factory equipment of all Maxwell plants is being brought to the highest point of mechanical efficiency, not through new plants or plant additions, but through the installation of production machinery of the most modern type in every department of the present plants.

The government of the United States has become too well stabilized through the creation of departments and the establishment of the routine of government in specialized hands, to permit of presidential election causing immediate changes which would be detrimental to either the interests of the country or of its business.

Psychological influences have been mainly responsible for presidential year business depressions in the past, Mr. Wilson said, and that business leaders are fully aware of this is shown in the constant effort that is being made to build up public confidence. Use of advertising space to create confidence is more prominent than ever before. Government statistics lend balance to public thought. Better understanding of national finances through augmented Federal Reserve statements would be beneficial.

Mr. Wilson spoke of a recent statement by the head of one of the largest automotive companies, in which the production plans of this company were detailed for at least thirty days in advance, as one of the most forward steps that the industry has taken, and was an indication that the industry has reached a point where it is operating on as stable lines as most others.

It is now possible for most companies through the receipt of constant information from the field to know the exact status of conditions and to base its production from month to month on definite grounds. This has taken most of the guess out of factory operations and made it possible to gage output exactly with demand.

Used cars, like the proverbial poor, will always be with us, Mr. Wilson said, but only as a problem until dealers have learned to control their businesses, and handle used cars by sound merchandising methods. Dealers who have been most obsessed by the used car problem have been those, as a rule, who were underfinanced, and not in a position to control sales. The well-financed dealer usually is in a position to accept trades at favorable prices. With more experience as merchants they will find less difficulty in moving used cars as they learn to direct their businesses according to market conditions.

Present difficulties with used cars were regarded by Mr. Wilson as only one phase of the general stabilization of the whole automotive industry. The same process of stabilization which has resulted in the gradual elimination of weaker manufacturers and which will continue to make eliminations for some time, is making eliminations in the retail field. Out of it all will come a stronger industry with the strong companies to do larger business in the steadily expanding market.

Mr. Wilson commended the educational work that the National Automobile Dealers Association is doing among dealers and said that a continuation of its efforts is bound to result in greatly improved merchandising throughout the trade.

Diefendorf Gear Plans Increased Production

SYRACUSE, Nov. 14—Plans for the extension of the business of the Diefendorf Gear Corp. of this city have been announced by W. H. Diefendorf, president of the company, upon the purchase of a new factory providing facilities for increased production.

The company has been organized for three years.

Service Rail Coach Division Sold Brill

Guernsey Goes with It as General Manager—Shipments to Go to Australia

WABASH, IND., Nov. 15—The railroad motor coach division of Service Motors, Inc., of this city has been sold to the J. G. Brill Co. of Philadelphia. The consideration was not made public.

Orders for mechanical parts for the railway motor coaches, aggregating $300,000 it is said, will be filled by the Service company, which will also manufacture trucks for the coaches. Increased sales through the activity of the eastern concern will benefit the local company, said Paul Moore, president of the Service company. Heretofore the Brill concern manufactured the bodies of the gasoline rail coaches made here.

The sale of the coach division will result in the transfer of the engineering and sales department to Philadelphia, and Charles Guernsey, vice-president of Service and general manager of the rail division will fill a similar position with the Brill company. A. F. McCormick will become district manager for the eastern concern. He has been division sales manager here and formerly was purchasing agent for Service.

Cars Going to Australia

PHILADELPHIA, Nov. 15 — Next month there will go forward from the plant of the J. G. Brill Co., this city, the first shipment of an order for twelve gasoline-propelled rail cars for the Australian Government. Other foreign countries are making inquiries.

Similar cars already are in use on forty railroads and other transportation lines in the United States and Canada.

The cost of running a branch-line train of two cars and an engine ranges from 75 cents to $2.50 per train mile, with accommodations for 120 passengers. The rail automobile, or bus, has been operated at from 35 to 40 cents a mile, doing nine miles on a single gallon of gasoline.

The cars are 43 5/16 ft. in length and weigh 28,000 pounds. They are now known as Brill Model No. 55 Gasoline Car.

F. E. Moskovics Receiver for Stevenson Gear Co.

INDIANAPOLIS, Nov. 13—Fred E. Moskovics, who resigned from Nordyke & Marmon last week, has been appointed receiver for the Stevenson Gear Co. of this city, on application of the Vonnegut Machinery Co.

It is said that the physical assets of the company are in excess of $300,000, with merchandise liabilities of about $60,000. Both creditors and management are said to believe that this is the best method of straightening out the affairs of the company.

Moskovics states that the company probably will be reorganized and refinanced in the near future.

At present the company has considerable custom gearcutting from manufacturers that will keep the plant busy. In the early days of the concern almost the entire endeavor of the management was in selling the rights to its newly patented process to automotive and other manufacturers. The custom gear making was a later development, and is said to be capable of great expansion.

Kentucky Wagon Plan Would End Bankruptcy

LOUISVILLE, KY., Nov. 14—Judge George Du Relle, referee in bankruptcy, has certified to Federal Judge Walter Evans the composition offer of the Kentucky Wagon Manufacturing Co. made to and accepted by creditors and recommended confirmation, which would end bankruptcy proceedings instituted against the company early this year.

Under the settlement offer, the wagon company agrees to pay 15 per cent of its debts in collateral trust gold notes of the National Motors Corp., of which it is one of eight units; 18 per cent in debenture notes of the corporation to take up six and twelve month unsecured notes of the corporation; 22 per cent in notes of the wagon company secured by 8 per cent preferred stock of the corporation, and 45 per cent in notes of the wagon company for the balance of debts.

Claims of creditors waiving deposits of securities by the company total $1,451,732.

Suit Filed by Rockwell Won by New Departure

HARTFORD, CONN., Nov. 12—Albert F. Rockwell of Bristol has lost all but one of the many points of his suit against the New Departure Manufacturing Co.

That Rockwell voluntarily resigned as general manager of the New Departure Manufacturing Co. in or about March, 1917, and was not in fact discharged by the company, and that as plaintiff he had no claim to royalties on single-row bearings manufactured by the company, were two important points in the decision filed by Judge William M. Maltbie of the Superior Court.

The court found one point at issue in favor of Rockwell, holding that he was entitled to royalties on domestic licenses. It has been estimated that if the claims of Rockwell for royalties and commissions had been allowed by the court they would have totaled well toward $3,000,000. However, the claim allowed, with interest, probably will be in the neighborhood of $30,000.

MIDWEST RUBBER DINNER

CHICAGO, Nov. 10—The annual dinner of the Midwest Rubber Manufacturers' Association will be held here on Jan. 29.

Fox Working on Plan for Reorganization

Assets of Company Now in Receivership Reported to Exceed Liabilities

PHILADELPHIA, Nov. 12—Plans are being formulated for reorganization of the Fox Motor Car Co., manufacturer of the Fox air cooled car, which was placed in the hands of receivers last week. It is expected that the reorganization will be effected within thirty days.

Ansley H. Fox, president of the company, answering the bill in equity filed by the petitioning creditors, the Adelphia Manufacturing & Plating Co. and the E. A. Wright Co., both of Philadelphia, joined in the request for the appointment of receivers.

Protection of Assets Sought

As the assets are far ahead of the liabilities, according to a statement filed by the company, and as the company claims to have many valuable patents and contracts with dealers and distributors, it was the belief both of the company and the petitioning creditors that the interests of the stockholders and all the creditors should not be jeopardized through suits, judgments and attachments at this time, but should be conducted by receivers on a business basis for the ultimate benefit of all and the conservation of the property and interests involved.

Inability to secure prompt extension of credit is ascribed as the cause of the application for receivership. The company says that, despite its heavy assets, it has been unable to liquidate them into ready currency to meet obligations due.

The Fox Motor Car Co. is a Delaware corporation with headquarters in Wilmington and a factory at Seventh Street and Grange Avenue, along the tracks of the Reading Railway in the outskirts of Philadelphia. It was incorporated in November, 1919.

Capitalization at Outset

The concern had capital, at the outset, of 30,000 shares of 8 per cent accumulated first preferred stock at a par value of $100 a share and 20,000 shares of stock of no par value. This authorized capital was increased in November, 1920, or one year from the incorporation, by designating the 20,000 shares of common stock of no par value as "Class A, common stock," and adding thereto 10,000 shares of common stock of no par value, designated as "Class B stock."

Its preferred stock has been sold at a price of $100 a share. Its common stock, Class A, was issued and made full paid in exchange for certain patents on air-cooling features on automobiles, notes and by the purchase of the assets and business of the Fox Motor Car Co. and the Air-Cooled Motor De-

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G.M.C. Sold 86,800 Vehicles Last Month

Compares with 69,081 in September—Quarterly Dividend Declared

NEW YORK, Nov. 13—General Motors units in October sold 86,800 cars and trucks as compared with 69,081 in the preceding month and 40,815 in October of 1922, according to the monthly statement of sales.

The issuing of this report follows the statement of President Alfred P. Sloan, Jr., in which he commented on the general situation in the industry and pointed out that October just past was the biggest month in the history of the corporation.

With the October figures, the total sales of the corporation for the first ten months of this year is 670,694 as compared with 359,660 for the corresponding period in 1922. Sales for the full year of 1922 aggregated 456,763.

The number of cars and trucks sold by months this year compared with last year follow:

	1923	1922
January	49,162	16,088
February	55,427	20,869
March	71,669	34,082
April	75,822	40,474
May	75,393	46,736
June	69,708	48,541
July	51,634	33,772
August	65,998	42,840
September	69,081	35,442
October	*86,800	40,815
November		50,232
December		46,871

*Preliminary figures.

Directors of General Motors have declared for the fourth quarter a dividend of 30 cents a share on the common, payable Dec. 12 to stock of record Nov. 19; $1.75 a share on the 7 per cent debentures, $1.50 on the 6 per cent debentures and $1.50 on the 6 per cent preferred, payable Feb. 1 to stock of record Jan. 7, 1924.

Remy Electric Will Buy Arvac Plant in Indiana

ANDERSON, IND., Nov. 13—The Remy Electric Co., through Irving J. Reuter, general manager, announces that arrangements have been made to buy the Arvac plant in this city, with its buildings and eleven acres of land, and to use the factory as an additional Remy plant.

The present plant and buildings of Remy are congested, it is stated, and traffic conditions around the present factory are unsatisfactory because of insufficient room. The Arvac plant will accommodate about 700 Remy employees.

EDWARD J. HATHORNE DEAD

NEW YORK, Nov. 12—Enward J. Hathorne, prominent in the tire industry for years, is dead at the age of sixty-nine. Mr. Hathorne formerly was assistant treasurer of the United States Rubber Co. and treasurer of the Rubber Goods Co. before it was taken into the United States Rubber Co.

NEW JERSEY RAILWAYS INSTALL BUS SERVICE

NEW YORK, Nov. 13—Sixty motor buses similar in size to those used on Fifth Avenue, New York, will be placed in operation immediately in leading cities of New Jersey by the Public Service Corp. of that State. The number will be increased as rapidly as franchises can be obtained.

The installation of bus service is a development of the recent strike in New Jersey. Approximately 147 municipalities in the State are served by the Public Service Corp.'s traction subsidiaries, and it is the belief of the officials of the corporation that the new bus service can be made a profitable one.

New Company Acquires Parts Depot in Detroit

DETROIT, Nov. 12—The Automotive Parts Co., Inc., official parts depot in Detroit for Continental Motors, Timken Axle, Borg & Beck, Brown-Lipe and a number of other specialized unit manufacturers, has been purchased by a new company organized by L. B. Fijux, formerly equipment representative of the Westinghouse Electric Co.

Fijux will serve as president and general manager. The company will continue operation under its old name.

The purchase also includes the branches of the Automotive Parts Co. in Toledo and Grand Rapids.

Los Angeles Speedway Is Sold for $2,000,000

LOS ANGELES, Nov. 14—The Los Angeles Speedway has been sold for $2,000,000, according to an announcement made here. The sale will not interfere with the races scheduled for Thanksgiving Day and Washington's Birthday.

The 200 acres will be subdivided for real estate projects, the speedway association retaining the stands, track, fences and other improvements, which undoubtedly will be removed to another location. The land is located adjacent to three of the main motor boulevards, and the property has become entirely too valuable for racetrack purposes only.

BODY BUILDERS TO MEET

NEW YORK, Nov. 13—The semi-annual meeting of the Automobile Body Builders Association will be held here Jan. 9 during the New York show. The association has secured for its various meetings the entire roof garden of the Waldorf-Astoria Hotel.

Fisk Rubber Reports Sales of $41,800,000

Current Assets as of Sept. 30 Bear 4.7 to 1 Ratio to Current Liabilities

NEW YORK, Nov. 12—In its balance sheet as of Sept. 30, the Fisk Rubber Co. reports sales for the first nine months of 1923 as $41,800,000. Net earnings available for interest are reported as $3,740,000, or more than three times the actual deductions for interest and financing charges for the period.

After deducting all charges and setting up reserves for Federal taxes and other contingencies, the net profit carried to surplus for the three quarters amounted to $2,103,000, bringing the surplus at the end of the nine months to $5,631,000.

Net tangible assets are placed at $40,532,379 after deducting all liabilities and reserves except the $9,000,000 first mortgage bonds outstanding on Sept. 30. The amount of net tangible assets per $1,000 bond was $4,504, of which more than $2,820 was in current assets.

Current assets as of Sept. 30 are reported as $25,380,000, compared with the current liabilities of $8,354,000, leaving a balance of more than $20,000,000 as working capital and a current ratio of approximately 4.7 to 1. The net current assets exceed the amount of first preferred stock outstanding by more than $1,000,000.

Operating Profit of $3,741,823

The profit and loss and surplus amount for the nine months shows gross sales, less reserves and allowance, of $41,826,601. After deducting cost of sales, including depreciation, selling and administration expenses of $38,084,778, the net operating profit amounts to $3,741,823. The comparative balance sheet shows current assets and current liabilities as follows:

CURRENT ASSETS

	Dec. 31, 1922	Sept. 30, 1923
Inventories	$13,520,790	$14,244,817
Acc'ts. and Notes Receivable less Reserve	9,082,096	7,635,536
Cash in banks, on hand and in transit	2,495,733	3,499,635
Total Current Assets	$25,098,620	$25,379,988

CURRENT LIABILITIES

	Dec. 31, 1922	Sept. 30, 1923
Loans Payable	$5,135,000	$3,185,000
Accounts Payable	1,761,578	2,108,700
Accrued Bond Interest	253,333	60,000
Total Current Liab.	$7,149,911	$5,353,700

"EXHAUST PORT" ISSUED

EAST MOLINE, ILL., Nov. 10—The "Exhaust Port," a publication by and for the employees of the Yellow Sleeve-Valve Engine Works, Inc., appeared this week.

Collins Suit Settled on Basis Set by Him

Will Pay $150,000 Into Peerless Treasury and Forego Bonus Collection

CLEVELAND, Nov. 15—Suits brought by David Rockwell, minority stockholder of the Peerless Motor Car Co., against Richard H. Collins, president of Peerless, and the company, were settled in common pleas court here today with the payment of $150,000 by Collins into the treasury of the company and his voluntary agreement to forego the collection of a $65 bonus on each car sold.

In addition Collins agreed to accept a salary of $75,000 per year in place of the $150,000 the company had agreed to pay him, but all of which Collins did not draw. Rockwell was allowed $75,000 attorney fees, or 50 per cent of what was recovered. The settlement of these suits follows very closely the first proposal made by Collins when he was informed of the litigation. He said then he preferred to make a personal sacrifice on account of his interest in Peerless, in which company he saw a wonderful future.

Four of the company's department managers have resigned as directors, and their places on the board are to be filled by stockholders who have not heretofore been identified with the management of the company. Collins said today:

Collins Makes Statement

"My fervent hope is that the settlement will thoroughly satisfy everyone who has had any grounds for criticism, and that the officers and directors will now be free to accomplish the big things which we have planned and which are certain to redound to the credit of the Peerless Motor Car Co. and the city of Cleveland.

Before I decided to come here and make a substantial investment in the Peerless Co. the Cleveland men who proposed to associate themselves with me assured me that the company's business would justify a compensation in harmony with the salary which I had been earning for a number of years previously. When the original salary arrangement was finally negotiated, I assumed that it was regarded as equitable and fair, since it was passed upon by a Board of Directors upon which sat some of Cleveland's best known business men.

Later, when this salary arrangement was criticized as not being in accord with Cleveland conditions, I told the board of directors several times that it was entirely agreeable to me to have it revised in any way so as to fit those conditions.

Yesterday's settlement evidenced the fact that there was no basis of criticism beyond the question of salary and bonus, as the decree entered judgment in my favor on all the matters complained of in the three other lawsuits, and now that the entire litigation has been settled I hope that everybody is perfectly satisfied.

PIERCE CLOSED CAR DEMAND

BUFFALO, Nov. 14—With sales in October reported to be the best in any similar month in its history, the Pierce-Arrow Motor Car Co. states that nearly 80 per cent of the orders received were for closed models.

NUMBER OF FAMILIES WITH 2 CARS GROWS

NEW YORK, Nov. 14—A survey made by the National Automobile Chamber of Commerce shows that one of the reasons for the rapid increase in registration is the fact that the number of families owning two cars is increasing.

In twelve out of 1000 letters from motorists received by the Chamber, the writers stated that they had more than one automobile. In some instances the writer devoted one of the cars solely to business and the other to family use.

Advertising Meeting Program Is Completed

NEW YORK, Nov. 15—The advertising committee of the National Automobile Chamber of Commerce has completed its program for the two days' meeting to be held in Cleveland on Nov. 22 and 23. The program follows:

NOV. 22
PASSENGER CAR DAY

"What Is News," M. F. Bradley, Durant Motors Corp.
"The Relation of Advertising and Sales," Geo. M. Graham, Chandler Motor Car Co.
"Use of Motion Pictures in Advertising."

Lunch

"Advertising to the Passenger Car Fleet Audience."
"Cooperation Between Dealer and Factory in Sharing Advertising Costs," E. LeRoy Pelletier, Rickenbacker Motor Co.

NOV. 23
MOTOR TRUCK DAY

"How National Advertising in Trucks Can Be Tied Up With the Local Campaign."
"Advertising of Used Trucks," Robert F. Wood, Autocar Co.
"What the Government Is Doing in Research for Commercial Motor Transportation," Henry R. Trumbower.

Lunch

"Opportunities for Cooperation in Parts and Completed Vehicle Advertising," Ezra W. Clark, Clark Equipment Co.
"Advertising of the Motor Bus."

Vehicle Operation Cost Put at $5,600,000 Yearly

LANSING, MICH., Nov. 14—At the joint session of the North Central division of the National Highway Traffic Association and the Michigan State Good Roads Association, which was held here, A. R. Hirst, Wisconsin State Highway Engineer, declared that the annual cost of owning and operating the motor vehicles in the United States, estimated at 14,000,000, is approximately $5,600,000 and the investment $10,000,000.

W. D. Packard Dies After Long Illness

With His Brother, J. W. Packard, He Founded Company Bearing Their Name

DETROIT, Nov. 12—The death of William D. Packard at his home in Warren, Ohio, this week, removed one of the founders of what is now the Packard Motor Car Co., and one of its large stockholders.

With his brother, J. W. Packard, William D. Packard cooperated in the building and selling of the first Packard cars by the Ohio Automobile Co., which was an offspring of the Packard Electric Co., in which latter company he was also a large stockholder. Mr. Packard was 62 years of age and had been an invalid for a number of years.

William D. Packard was accredited with the business development of the first Packard cars, while J. W. Packard contributed the mechanical talent. Thirty years ago they founded the Packard Electric Co., manufacturers of electric cables and lines, which became the second largest of its kind in the world and in recent years has been a large producer of automotive equipment. The first Packard car appeared shortly after the foundation of the electric company, and its first superiority was accredited to the excellence of design of its electric equipment.

The first car was placed on the market in 1900, and three years later the brothers sold a large part of their interest in the company to the present Packard organization, at which time the plant was moved to Detroit. W. D. Packard was widely known in Detroit, although, because of his illness, he had spent little time here in recent years, devoting most of his time to philanthropic works. His son, Warren Packard, advertising manager of the Detroit Packard retail branch, resides here.

New Erie Rubber Formed and May Get Old Company

TOLEDO, Nov. 14—Sale of the Erie Tire & Rubber Co. plant at Sandusky was ordered set for noon Nov. 20 by Judge Paul Jones, sitting in the United States District Court. Effort was made to sell the plant previously at the upset price of $1,300,000, but there were no bidders.

Fordyce Belford, special master in charge of the sale, has been ordered to try to sell the property at a new price of $330,000. It is estimated that claims run about $500,000.

Today the Erie Rubber Corp. was incorporated by E. B. King, attorney, who has been representing the receiver, with nominal capital of $500, and it is believed Sandusky interests may use this new corporation as a vehicle for purchase of the property.

Industry Not Slated for Lowered Taxes

Government Feels That Revenue Is Too Great to Be Removed at This Time

WASHINGTON, Nov. 14—It is obvious that the excise tax on automobiles will not be lifted by the incoming Congress. Secretary of the Treasury Mellon, in his letter to the acting chairman of the Committee on Ways and Means, suggested the removal of miscellaneous nuisance taxes, but failed to mention discriminatory taxes on automobiles. It is known, however, that Treasury experts do not approve the elimination of this assessment, as it is one of the most productive and constant of tax levies.

By indirection, at least, Secretary Mellon served notice that the excise tax on automobiles and trucks was not listed for repeal at this time. He declared that "there is not enough margin of revenue available to permit the repeal of the special taxes which are proving productive."

It was his contention that the law could be revised to good advantage and some of the nuisance taxes repealed without a material loss of revenue. The Treasury Department favors the repeal of the tax on admissions, telegrams, telephones and leased wires, also the luxury tax on jewelry.

Organizations Plan Campaign

Organizations of manufacturers, dealers and car owners who have fought for the repeal of the excise taxes on automobiles feel that a wider campaign of education will be necessary to convince Congress and the Administration of the necessity of this relief. The American Automobile Association and the National Motorists Association have mapped out a campaign against the continuation of the war tax.

There is no assurance that the program will be adopted. It is certain that it will be strongly opposed in Congress, at least in a number of important respects. The proposed reductions are based on the calculation that there will be no soldiers' bonus and can only be made "possible if the Government keeps within the program of expenditure which the Bureau of the Budget has laid down at the direction of the President." Even Senator Smoot, who probably will be chairman of the Committee on Finance, is on record to the effect that there will be no reduction in taxes of any kind.

The question of a bonus will be bitterly fought, and it is quite evident that it will find strong support in Congress. President Coolidge is understood to take the position of the late President Harding in opposition to a bonus.

A. A. A. Sends Letter on Repeal

WASHINGTON, Nov 14—Major Roy F. Britton, chairman of the legislative board of the American Automobile Association, has written to Congressman William R. Green, acting chairman of the Committee on Ways and Means, urging the repeal of war taxes on automotive products.

He declares that the war excise tax on motor vehicles, repair parts, tires and accessories is a tax on transportation and should be removed along with the tax on telegrams, telephones and leased wires which Secretary Mellon recommends for repeal as "the last of the transportation taxes established during the war."

Midwest Rubber Acts

CHICAGO, Nov. 13—The Midwest Rubber Manufacturers' Association at its monthly meeting here today passed a resolution urging the abolition by Congress of the 5 per cent war tax on automobile tires. A committee was appointed to prepare a proper presentation of the association's attitude and forward it to members of Congress.

Indications of improvement in the tire industry were reported by a number of members.

WORLD REGISTRATION SEEN AS 17,000,000

WASHINGTON, Nov. 14—Seventeen million automobiles—passenger cars and trucks—will be in operation in the world by the end of this year, according to a preliminary estimate made by H. H. Hoepli, acting chief of the Automotive Division of the United States Department of Commerce.

The approximate number of cars and trucks in operation at the close of the calendar year 1922 is estimated by the Bureau at 14,500,000; the total world production this year is placed at close to 4,500,000. From the total thus reached, 19,000,000 vehicles, are deducted some 2,000,000 which are worn out and ready to be discarded or junked.

The total of 17,000,000 passenger cars and trucks in operation in the entire world represent an increase of about 17 per cent over a year ago.

About 14,000,000, or over four-fifths of the total, are in use in this country, which lists approximately one car or truck to every eight persons. In the world the production is one to 112.

DEPENDABLE TRUCK RECEIVER

GALESBURG, ILL., Nov. 14—Crescent O'Connor has been appointed receiver for the Dependable Truck & Tractor Co. by Judge Hillyer in the Circuit Court on petition of creditors, who have filed suits against the company. Status of the company will not be ascertained until the receiver has had opportunity to make out a preliminary statement of conditions.

Tire Dealers Discuss Merchandise Policies

Adopt Thirteen Resolutions at Convention—Spirit of Co-operation Shown

NEW YORK, Nov. 14—Representatives from over fifty cities and towns scattered from Portland, Ore., to Baltimore, Md., attended the fourth annual convention of the National Tire Dealers Association, held at the Hotel Pennsylvania, here, this week. Thirteen resolutions were passed by the delegates, expressing the opinion of tire dealers about merchandising practices in the industry.

Among the more important proposals made by the retailers are:

Tires should be distributed only through dealers whose principal business is selling tires for profit.

Manufacturers should discontinue the sale of tires direct to commercial accounts. Such sales should be handled through dealers.

All spring and seasonal datings should be eliminated.

Only four tires and tubes per car should be sold to car manufacturers as original equipment.

Standardization of tire sizes is urged in order that the dealer may be permitted to reduce his stocks.

Tires should be sold to tire dealers and to car manufacturers at the same price.

Tire manufacturers should not sell tires direct to car dealers unless car dealers are willing to carry a stock.

Every effort should be made to see that tires sold for original equipment stay on the car until it reaches the hands of the user.

Sale of tires to consumers from factory branches should be discontinued.

A conference is urged every three months between a committee representing tire manufacturers and one representing tire dealers.

Throughout the three-day session a desire to cooperate and work with tire manufacturers was emphasized strongly. The first resolution officially passed by the convention thanked the manufacturers for their unselfish attitude and expressed confidence in the aims, objects and activities of the manufacturing organizations.

About 200 persons attended the convention, a vast majority of whom were tire dealers.

$1,500,000 Bond Issue Authorized for Haynes

INDIANAPOLIS, Nov. 13—Haynes directors today announced that a campaign to sell $1,500,000 in bonds is to be started at once. The money will be used in refinancing the company, according to the officers, and to put the company on a paying basis.

Of the bond issue, $500,000 will be taken by the directors and the remainder will be offered to the public. Consummation of the plan is conditioned on the sale of $1,000,000 of these bonds, including the $500,000 to be taken by the directors.

Pace of Ford Sales Keeps Up to Output

Reports Indicate That Few If Any Cars Are Being Held by Dealers

DETROIT, Nov. 12—The difference between Ford Motor Co. production and sales at retail by dealers in the first ten months of 1923 is the difference between 1,584,356 and 1,522,840, or 61,516, according to officially released figures.

This balance represents less than nine days' factory output, and, when allowance is made for cars in transit, shows that the factory and dealers are working on an even basis, with few if any cars in dealers' hands.

These official figures make certain that at least half of the industry's output of the year to date is in owners' hands. In November the factory will reduce its schedule to about 150,000 and expects that a number of this output will be stored by dealers against spring demand.

It is hoped by sales executives that a percentage of the output is stored as necessary to meet the early year rush, but the opinion is expressed that dealers will not be able to store as many as they will need, because of continuance of heavy buying.

Factory Behind on Closed Orders

The factory is considerably behind the requirements of dealers for closed models, and this is true of practically all factories producing popular closed models. Other leading companies in low priced lines are having difficulty in meeting dealer requirements for closed cars and report no stocking by dealers as yet for spring.

Factories are centralizing their efforts on closed models and are behind on deliveries. Closed car business alone will mean a high production total for November and there is a continuance of good demand for open models.

Yellow Cab in New York Purchases Fay Company

NEW YORK, Nov. 13—Control of the Fay Taxicab Co., Inc., has been acquired by the Yellow Taxi Corp., pioneer operator of taxicabs in this city, which has also taken steps toward the acquisition of the Yellow Cab Co. of Philadelphia.

In purchasing the Fay company the Yellow Taxi Corp. acquires 400 cabs, which gives it a total of 1700 vehicles here.

A meeting of the stockholders of the Yellow Taxi Corp. has been called for Nov. 23 to authorize an increase in the capital stock from 100,000 to 400,000 shares. This would facilitate the acquisition of the Philadelphia company and provide funds for corporate needs.

It is proposed to acquire the 5000 shares of common stock of the Philadelphia concern by exchange of the new stock of the Yellow taxi on the basis of five shares of the New York company for one share of the Philadelphia company.

In making announcement of the purchase of the Fay Taxi Cab Co., William E. McGuirk, president of the Yellow Taxi Corp., said that taxicab rates had not as yet touched as low a level as they should.

Bassett of Buick Sees Good Export Year Ahead

NEW YORK, Nov. 12—Increased export business for the Buick Motor Co. next year is predicted by President H. H. Bassett upon his return with other General Motors executives from a two months' trip abroad. He declares that the outlook for business is excellent in the British Isles, Spain, Holland and Belgium, but that owing to the duty in France and Italy, the outlook in those two countries is not so promising.

"Our export business," Bassett said, "represents from 12½ per cent to 15 per cent of our production and is greater than it has ever been. Buick produced more than 23,000 cars last month and will probably turn out more than that number this month. I estimate production next year at between 225,000 and 250,000 cars."

Standard Permanent Top Order Is Placed by Moon

INDIANAPOLIS, Nov. 12—The new Victor Top Co. of this city has been awarded a contract to supply a standardized permanent top for the Moon Motor Car Co. of St. Louis. It is understood that Moon will make this an optional equipment on some of its open cars at $100 extra.

The Victor company is also making special tops for the Ford and Chevrolet and others, for sale to dealers and distributors.

The officers of the company are Frank M. Crawford, formerly of Connersville, Ind., president; Fred V. Miller, vice-president in charge of production; A. R. Young, sales manager, L. O. Warfel, secretary, and Berkely Orr, treasurer.

The plant of the concern is located in a separate section of the old Premier factory.

New Gardner Sport Sedan Shows Added Equipment

ST. LOUIS, Nov. 15—A new sport model has been added to the Gardner Motor Car Co.'s line of closed cars.

The new model is made up of a regular sedan body mounted on the standard Gardner chassis with additional equipment as follows: Tuarc steel wheels, trunk rack, rails and trunk, spare tire, tube and cover mounted on the side, aluminum step and scuff plates, nickel-plated radiator shell, nickel head lamps, cowl lamps and a double bar bumper.

It is finished in either of two colors, the Crane Simplex Duotone or the Gardner limousine blue.

Ford Plans 10,000 Cars Daily in 1924

Higher Rate Is Contingent Upon Completion of Plants Now Under Way

DETROIT, Nov. 13—Reports that the Ford Motor Co. is making inquiries among parts and material supply sources for accommodations for 10,000 units daily in 1924 are only confirmatory of the company's plan for a peak output of 10,000 daily in the coming year. Similar inquiries were made at this time last year for supplies for 7000 units daily, a total which was reached during the peak of the manufacturing period of the present year.

The production of 10,000 units by Ford daily is contingent upon the completion of the St. Paul manufacturing plant and other building operations now in progress and probably will not be reached until well into the 1924 season. Capacity of present plants is represented fully in the high production totals of this year, and not much increase can be made on these totals until the new building projects are completed and ready for operation.

Limiting factors on production now are mainly the body supply source and the capacity of the Highland Park plant for manufacturing operations. All major units and parts for assembly into Ford cars are manufactured at the Highland Park plant, which has about reached its capacity for this work.

This will undoubtedly result in the creation of super-assembly plants such as the St. Paul project and possibly the Philadelphia plant, which will both assemble cars and manufacture parts for other car assembly plants in their districts.

Rushing Work in Philadelphia

PHILADELPHIA, Nov. 13—A speed-up program has been ordered for the Ford Motor Co., and no less than thirty-two manufacturers in Philadelphia will supply materials, including wire, bodies, ball bearings, batteries, upholstery and fan-belts, while the Philadelphia district, including points in the State, will supply steel, steel tubing and numerous other products.

The Ford Motor Co. officials are now completing plans for the erection of the big assembling plant in West Philadelphia. Many of the manufacturers here have received telegrams from Detroit, requesting an increase of production as a cooperative movement in the effort of the Ford concern to produce a record-breaking number of cars daily.

On the basis of the production program for 1924, the company will build approximately 3,000,000 automobiles. The present output is 7500 cars a day, and the total cars and trucks expected to be turned out this year is approximately 2,000,000.

The contract for the steel work on the new assembling plant has been awarded.

Ford Now Producing New Two-Door Sedan

Mounted on Standard Chassis, Seats Five Passengers and Lists at $590

DETROIT, Nov. 12—The Ford Motor Co. is now in production of a new two door sedan priced at $590 which it has styled the Tudor sedan. The features of the model are the 28¾-in. doors and side windows running back from the doors 32 ins. which, with a large rear window, gives complete visibility practically all the way round. The bodies are being built at the Ford River Rouge plant.

The Tudor sedan is built for five passengers, three in the rear with a tilting seat opposite the driver which folds compactly out of the way affording easy passage through the wide door. The driver's seat is of bucket design with easy cushion and back and located to give plenty of leg room. The gasoline tank is under the driver's seat leaving the passengers free from disturbance. Doors are located at the front of the car and swing open forward on either side in line with the driver's seat.

Externally the car corresponds in general lines to the recent new Ford models, being mounted on the standard chassis. The roofline is low and straight which, with the recent new radiator, gives an opportunity for graceful lines. All window glasses are lowered flush with the frame. The exterior appearance is further aided by windshield, visor, cowl, ventilator and secure rear fenders of a new design.

The upholstery is in special Ford fabric of dark brown with floor rug to match. Both doors and side windows are equipped with revolving type window regulators.

Deliveries to dealers are now going forward from the assembly plants.

McFarlan to Produce Companion to Its Six

CONNERSVILLE, IND., Nov. 11—A companion car to the McFarlan six is about to be put on the market and will be on exhibition at the National shows.

The new car will be mounted on a 127-in. wheelbase chassis and equipped with a Wisconsin engine rated at 75 hp. A complete line of bodies will be provided. Prices range from $2,500 to $3,000.

The larger model which will be continued has a wheelbase of 140 in. and its list price ranges from $5,400 to $10,000.

The company reports that October was the largest in its history for manufacture, shipments and sales.

ALBERT D. JOHNSON DIES

INDIANAPOLIS, Nov. 12—Albert D. Johnson, secretary and treasurer of the Diamond Chain & Manufacturing Co. and long identified with the bicycle industry, died at his home here. In the early bicycle days Mr. Johnson was associated with C. F. Smith of the Waverly Bicycle company. In 1889 he joined with L. M. Wainwright in organizing the Central Cycle Co., maker of Ben Hur bicycles. When the Diamond Chain Co. was organized in 1905 Mr. Johnson became secretary and treasurer.

Lexington to Proceed with Its Light Model

CONNERSVILLE, IND., Nov. 12—The Lexington Motor Car Co. has received the permission of creditors and the approval of the receiver to proceed with its new light six model. Work at the factory has started on the preliminary cars which probably will be ready for the New York show. The larger model will be continued.

The new car will be mounted on a wheelbase of 119 in. There will be two body models, a five-passenger phaeton to sell at $1,395 and a five-passenger sedan at $1,845. In general the small model follows the lines of the larger, but there are minor changes in several of the units.

The bore of the Ansted engine has been increased to 3 5/16 in. from 32¼ in. Pressure feed to the rocker arms is now employed and many of the dimensions have been increased to give higher factors of safety and longer life. The Long clutch has been adopted as well as Warner type T-64 gearset, Ross steering gear and pressure type lubrication.

New Maker of Elgin Car to Produce Within Week

INDIANAPOLIS, Nov. 12—Production is about to start at the plant of the Elgin Motor Car Co. here and the first three cars turned out will be exhibited in Chicago within a week.

The car will be made in three models, a sport, coupé and sedan selling respectively for $1,895, $2,145 and $2,345. They will be equipped with four-wheel brakes of the mechanical internal expanding type, also Cutler Hammer mechanical gearshift, United air cleaner, and magnetic tilting head lamps.

The car differs materially from the design formerly bearing the Elgin name. The engine is now a Falls special with DeJon electrical equipment and a Stromberg carbureter. The clutch is a Borg & Beck, the gearset a Warner and the axles Columbia. The tires are 32 x 4½ in. cords and spares are included as equipment in the list price.

NEW CLIMAX ENGINE

CLINTON, IOWA., Nov. 10—First patterns of the new Climax product, the Climax-Hindl-Diesel engine, largest of the Climax Engineering Co. family, are being worked upon now under direction of Lee Hull. It will be a high-speed, 300-horsepower, six-cylinder crude oil burning engine operating on the Diesel cycle.

Michelin Balloon Tire Fits Standard Rims

Will Be Marketed as "Michelin Comfort Cords" and Made in Five Sizes

NEW YORK, Nov. 9—The Michelin Tire Co. has announced that it will place on the market immediately a line of low pressure balloon tires made to fit existing standard rims.

These will be sold under the name of "Michelin Comfort Cords," and are claimed to last longer than ordinary cords, to increase the life of the car from 50 to 100 per cent, to be less subject to puncture and to absorb less energy, as well as to possess other advantages, such as easier riding qualities, better traction and lessened danger from skidding, ordinarily attributed to this class of tire.

Five sizes will be produced as follows:

Michelin Comfort Cords	To Replace Ordinary Cords
33 x 5.70 in.	31 x 4 or 32 x 4½ in.
34 x 5.70 in.	32 x 4 or 33 x 4½ in.
35 x 5.70 in.	33 x 4 or 34 x 4½ in.
35 x 6.60 in	32 x 4½ or 33 x 5 in.
37 x 6.60 in.	34 x 4½ or 35 x 5 in.

In section the new tire is about 50 per cent higher and about the same amount wider than the conventional cord, and will sell at a somewhat higher price. Inflation pressure will be from 20 lb. upward, depending on size of tire and weight it carries.

Although larger in diameter the new tire flattens out more than the one it replaces so that the effective radius remains practically unchanged and ground clearance is not noticeably altered. Dealers are cautioned, however, to measure the car before fitting the new tire in order to be certain that clearance at mud guard is sufficient.

Cantilever Foot Brake Feature of Eagle Truck

ST. LOUIS, Nov. 14—The Eagle Motor Truck Corp. has designed a new model 104 Eagle truck of 2-ton capacity.

A new feature of the truck is the cantilever foot brake which requires but little pressure to apply the maximum pressure on the brake drums. The change has been made in the transmission of the power from the brake pedal to the drums.

An additional 4000 sq. in. has been added to the radiator cooling surface, and all malleable iron has been replaced by electric steel and drop forgings.

The model CTU Buda engine used in the Eagle 1923 models has been replaced by a GTU Buda engine in the 1924 Eagle. This engine has ¼ in. larger bore.

The steering gear of the new truck is now a Ross with a special low gear ratio, which reduces road shocks to the steering wheel.

Men of the Industry and What They Are Doing

G. M. Executives Back from Europe

General Motors executives and engineers who attended the foreign shows have returned home. In the party were H. H. Bassett, president and general manager of the Buick Motor Co.; F. A. Bower, assistant chief engineer of the Oakland Motor Car Co.; W. H. Moyse, chief engineer of the Canadian company; W. R. Strickland, assistant chief engineer of the Cadillac Motor Car Co.; R. K. Jack, chief engineer of the Olds Motor Works, and Lawrence Fisher and A. J. Fisher of the Fisher Body Corp.

Mooney Elected G. M. Director

James D. Mooney, president of the General Motors Export Co., has been elected a director of the General Motors Corp. He was elected a vice-president of General Motors a year ago, when he was placed in charge of exports.

Hertz Goes to Europe

John Hertz, president of the Yellow Cab Manufacturing Co., sailed for Europe on Wednesday to spend several weeks in the interest of the foreign business of the company.

Daum Elected a Vice-President

George W. Daum has been elected a vice-president of the Pennsylvania Rubber Co.

Klaxon Advances Hahl

H. E. Hahl, for some time in the service department of the Klaxon Co. at Newark, N. J., has been placed in charge of that work as service manager.

Weil Cadillac Sales Head in Canada

Edward J. Weil has been appointed general sales manager of the Cadillac Motor Car Co., Canada, Ltd., with headquarters at Oshawa, Ont. Weil was transferred from the production division of the Detroit factory to become general manager of production of the Oshawa Cadillac plant upon its establishment last February. He will continue in this capacity in addition to acting as general sales manager. Before joining the Cadillac organization in Detroit at the close of the war, Weil was engaged by the Wright-Martin Aircraft Corp. to organize production and manufacture the Hispana-Suiza eight-cylinder motor for the French government. Later he did the same work for the American government.

Denman-Myers Makes Changes

Harry F. Webster has been promoted from the position of secretary and factory manager of the Denman-Myers Cord Tire Co. of Warren, Ohio, to the post of general manager. He formerly was connected with both the Goodyear and Firestone companies. Following his recent promotion, P. R. Manahan, chief chemist, has been appointed factory manager. A. J. Martin has been made assistant sales manager after serving two years as advertising and sales promotion manager, while J H. Appelby, district manager, has been named Western division sales manager, with headquarters in Chicago.

Martin with General Electric

Harold M. Martin, formerly service engineer with the Bijur Motor Lighting Co., is now with the General Electric Co., associated with C. F. Scott at the Bloomfield Works. Martin will be in charge of electric dynamometer sales and engineering.

4 Speakers to Address Motor Truck Industries

DETROIT, Nov. 15—Speakers at the annual meeting of Motor Truck Industries, Inc., Nov. 21, will be W. I. Irvine, former representative of the Department of Commerce Abroad; David Beecroft of Motor Transport; Millard H. Newton of Bus Transportation, and Arthur Livingstone of R. L. Polk & Co. The respective subjects will be export conditions, the fleet owner, motor bus development and territorial sales surveys.

The meeting will be held at the Detroit Athletic Club in morning and afternoon sessions. The business session will be short, leaving most of the day to the speakers and round table discussions. In addition to members, the association has invited a number of representatives of other truck and parts manufacturing companies.

Ford Plans Completed for New Dallas Plant

DALLAS, TEXAS, Nov. 15—The Ford Motor Co., it is reported, has completed plans for the erection of a new asssembling and distribution plant in this city.

The new plant when completed will more than double the capacity of the present plant located here. It will cover 300 x 800 feet, and will cost more than $350,000, excluding the site, which it is estimated will represent an outlay of $150,000. It is expected the plant will be in operation the latter part of next year.

BERKSHIRE PRODUCTS RECEIVER

PITTSFIELD, MASS., Nov. 15 — George H. Southard, Jr., has been appointed temporary receiver of the Berkshire Products Corp. of this city by Judge William A. Burns of the Superior Court. Pending an application for a permanent receiver returnable Dec. 8, Southard will continue to operate the business. It is declared that the company is solvent.

A. E. A. Reports Sales Exceeding Last Fall

Check Up at Convention, Attended by 3,000, Shows No Decline from Summer

CHICAGO, Nov. 14—A continuous merchandising campaign with the addition of a special effort to promote replacement part sales was the principal recommendation before the Automotive Equipment Association, in convention here this week. The merchandising committee proposed that a motion picture be produced to educate dealers and repairmen in the principles of good maintenance and service work and to suggest practical methods of developing this line of business.

It was expected that the convention would approve of the committee's recommendation and that the propaganda work of the association for the coming year would be built around a replacement parts campaign with auxiliary attention to the "Ask 'em to Buy" and "Shop Profits" campaign, which promoted the first and second steps in the association's merchandising work.

The convention brought together the largest gathering in the history of the Automotive Equipment Association. More than 3000 manufacturers, jobbers and their sales and service representatives were present. The attendance included about 200 non-member jobbers and buyers who were the invited guests of the association.

Business Exhibit Held

In connection with the convention the association also held its fifth annual and largest business exhibit, at which 237 manufacturer members exhibited in the accessory replacement parts and shop equipment line.

Reports of jobbers from all parts of the United States and a check up on patronage given the manufacturers at the show indicated that the automotive equipment business this fall is running ahead of all previous records. Contrary to past experiences, there has been practically no slowing up from the summer business level, a condition which is attributed in part to the general prosperity of the country, in part to the large number of cars and trucks in service and, to quite an extent, to results already obtained as a result of the association's campaign to promote automotive gifts for Christmas.

William E. Wissler of the Herring Motor Co., Des Moines, was nominated for president, and William T. Morris of the American Chain Co., Bridgeport, Conn., for vice-president. The presidential nominee is a jobber.

Percentages Show Movement in Tires

Rubber Association Compares September with August and Previous Year

NEW YORK, Nov. 12—The Rubber Association of America has issued its second monthly statistical bulletin showing the percentages of increase or decrease in tube, casing and solid tire inventory, production and shipments for September, 1923, as compared with August and with September, 1922. The percentages follow:

	Compared with August.	Compared with Sept., 1922.
INNER TUBES		
Inventory	7 —	25 +
Production	9 —	7.1—
Total Shipments	14.4—	3.5+
Original Equipment	10.8—	49.5+
Other sales	15.6—	6.5—
Export	11.1—	5.6+
PNEUMATIC CASINGS-CORD		
Inventory	7.3—	69.6+
Production	15.9—	18 —
Total Shipments	4.9—	14.1+
Original Equipment	1.8+	14.2+
Other sales	7.5—	13.5+
Export	4.2—	38 +
PNEUMATIC CASINGS-FABRIC		
Inventory	18.2—	31 —
Production	10.7—	20.3—
Total Shipments	7.9—	5 —
Original Equipment	20.5—	97.4+
Other sales	3.1+	30.5—
Export	41.3+	40.5—
SOLID TIRES		
Inventory	5.1—	24.7+
Production	23 —	55.2—
Total Shipments	1.9+	29 —
Original Equipment	13.4+	16.2—
Other sales	5.7—	37.1—
Export	32.3+	18.7+

+ Shows percentage of increase.
— Shows percentage of decrease.

Cumulative totals of production and total shipments for casings, tubes and tires from January through September for 1922 and 1923 are as follows:

	1923	1922
CASINGS-CORD		
Production	15,349,771	10,632,412
Total Shipments	13,985,770	9,718,857
CASINGS-FABRIC		
Production	11,393,388	12,000,989
Total Shipments	11,825,281	12,145,548
INNER TUBES		
Production	34,532,458	27,087,441
Total Shipments	33,666,298	26,769,738
SOLID TIRES		
Production	587,349	538,127
Total Shipments	566,199	515,288

MARTIN SUBPOENAS QUASHED

WASHINGTON, Nov. 14—Justice Siddons of the Circuit Court of the District of Columbia has quashed subpoenas served against the Loening Aeronautical Engineering Co., the Dayton Airplane Co., Glenn L. Martin Co. and Samuel S. Bradley on the ground that these defendants, named by Capt. James V. Martin, aircraft manufacturer, in a damage suit for $51,510,000, were not suable in the district. Captain Martin claimed that the sixty-five defendants named in his action had conspired to ruin him. About twenty subpoenas have been quashed here thus far.

Henderson Tire Reaches 80 Per Cent Capacity

COLUMBUS, OHIO, Nov. 14—The Henderson Tire & Rubber Co., which operates a tire and tube manufacturing plant in this city, is operating at more than 80 per cent of its capacity, with a day and night shift employed.

Future business booked so far, it is said, assures practically full operation of the plant for the first half of the coming year at least. At present only about 10 to 15 per cent of the company's output of tires are fabrics and it is planned to devote all the facilities of the plant to making cord tires soon after the first of the year.

Plans have been made for the installation of five additional tire making machines and one tubing machine at the end of the year in order to increase output.

Still Seek Standard Balloon Tire Sizes

(*Continued from Page* 1018)

present rims was discussed some months ago in Rubber Association circles and that it was then considered unwise, owing to the likelihood of misunderstandings which would be apt to result through overloading or substituting, for example, a 35 x 5 in. balloon tire for the same nominal size of ordinary cord instead of for 33 x 4 or 34 x 4½ as intended and then running it at the reduced pressure with consequent rapid destruction of the overloaded tire.

It is predicted that all or nearly all makes of cars will offer ballon tires either as standard or as optional equipment by the time of the New York show, but tire makers say that they will require about three months to get into production, once it is decided what sizes will be required. It is assumed that an equal length of time will be required by rim and wheel makers.

ASKS AMCO RECEIVERSHIP

INDIANAPOLIS, Nov. 13—The Cincinnati Screw & Machine Co. has filed suit here against the Amco Manufacturing Co., maker of automotive products, asking that a receiver be appointed. The petition states that the concern is amply solvent, but that it does not have money on hand to pay claims past due. During September the Amco company suffered a serious fire loss.

Tells of Truck Right to Forward Freight

That Point Looms Large at New Haven Hearing Before Commerce Commission

WASHINGTON, Nov. 14—Right of motor trucks to act as a forwarding freight agent in conjunction with railroads was pointed out by Henry Thurtell, attorney for the Clyde Line and other carriers, in argument before the Interstate Commerce Commission this week.

The hearing was held in connection with an informal representation of the New York, New Haven & Hartford Railroad that the arrangement between the Starin-New Haven Steamship Co., the Clyde Line and the Southern Railway took business away from it.

Question of Agents Brought Up

The hearing became a discussion of the right of a carrier to hire agents to perform transportation services for it rather than an argument concerning the legality of tariffs. Wilbur LaRoe, Jr., representing the Port of New York Authority, said that the Commission could deal with the question, if it all, under the section of the law giving jurisdiction to inquire into the efficiency of management.

He stated that there could be no question of the legality of trucks serving as agents of railroads and other carriers, as the practice is national in scope as evidenced by tap lines in the South, trucks in St. Louis and industrial lines in the North.

The growing importance of the motor truck to rail carriers was illustrated at the hearing. M. B. Pierce of the Erie Railroad told the Commission that Erie tariffs showed the amounts paid to trucking firms in effecting store door and interior Manhattan station delivery. It was his contention that the trucking company was a servant of the Erie, as are the employees.

Truck Proves Economical

It was brought out that the Erie saved about $1.60 per ton on traffic moving under lighterage free rates. LaRoe stated that the cost of bringing such traffic from the New Jersey to the New York shore under lighterage was about $3 per ton, but under the arrangement with the trucking companies that agent accomplished the work at a cost to the Erie of $1.40 per ton, or 7 cents per 100 lb.

It was pointed out that the Baltimore & Ohio could serve Richmond, Va., by means of motor trucks, without regard to the railroad, from Potomac Yards to Richmond. Thurtell made the statement that the Central Railway of Georgia and the Seaboard Airline, without physical connection at Atlanta, did business on joint rates by transferring freight by truck through Atlanta.

Spring Test Methods Discussed by Litle

Vibration Studies Presented by Lincoln Engineer Before Indiana S. A. E.

INDIANAPOLIS, Nov. 12—T. J. Litle, Jr., chief engineer of the Lincoln Division of Ford Motor Co. addressed the members of the Indiana Section of the Society of Automotive Engineers here on new methods of testing springs of cars in motion, and of other vibration studies to which the engineer must resort at times in convicing non-technical management of needed advancement or changes. The meeting was attended by more than 150 members of the section and their friends.

With charts and diagrams Litle graphically pictured and described the seismograph which recorded tonneau movements and the instrument which, at the same time, recorded the movements of the springs themselves.

These records, made on long strips of paper, were later hung on the walls in order that the comparative tests made with different spring and shock absorber equipment could be studied. Litle also described the shock absorber with a neutral zone that was evolved as a result of study of the charts.

Engine vibration, said Litle, cannot be studied by this sort of apparatus, but much simpler experiments which he described were later found to be successful in eliminating one by one, nine possible causes of intense engine vibration which was finally traced to heavy reciprocating parts.

Litle urged technical men to apply themselves to new methods and not to be above selling themselves and new ideas to the management by the use of slightly theatrical physical experiments when that is needed.

Midwest Section Hears Beecroft

CHICAGO, Nov. 10—Speaking before the Midwest Section of the Society of Automotive Engineers here last night, David Beecroft emphasized the urgent need for closer cooperation between engineers who design commercial vehicles and those organizations which operate them.

The engineer, Beecroft said, should have before him constantly the idea of designing a vehicle which will earn the most dollars. The earning capacity of a truck or bus is of primary importance to its user. This fact should be fully recognized when original drawings are being made.

Beecroft pointed out that the big contest for business really has just begun among truck manufacturers. The user of trucks and buses today, he said, is purchasing transportation and earning power rather than chassis and body specifications. He went on to cite specific examples to illustrate his conclusions.

H. L. Horning of the Waukesha Motor Co., discussing Beecroft's paper, said that vehicle makers will have to give more attention to accessibility and fuel efficiency in developing future designs. George Pride of the Autocar Co. urged that the engineer become more of a business man and said that manufacturers should do everything possible to reduce maintenance cost.

James Speaks on Brakes

BOSTON, Nov. 10—W. S. James of the Bureau of Standards was the speaker at the November meeting of the New England Section of the Society of Automotive Engineers when he gave an illustrated talk on brakes. He brought out various features of four-wheel types as compared with two-wheel brakes and had a small model of a truck that was so equipped that both two and four wheels could be braked. With this he demonstrated the efficiency comparisons of both kinds.

He explained the workings of the decelerometer and on the following afternoon gave an outdoor exhibition of the device on cars using both two and four-wheel brakes.

N. A. C. C. Traffic Files to Be Moved to Detroit

NEW YORK, Nov. 13—Through action of the directors of the National Automobile Chamber of Commerce, the permanent records of the traffic department, tariff files and claim work will be moved from New York to the western division traffic office in Detroit. Arrangements will be made at once and the date of change announced at a later time.

This action is due to the desire of the directors to make the records more accessible and of greater assistance to members of the Chamber by placing them in the center of shipping activities.

The monthly meetings of traffic managers, to which all members of the Chamber will be invited to send representatives, have been provided for. It is felt that by holding these meetings in Detroit attendance and participation in the work undertaken by the traffic department will be facilitated. J. S. Marvin, general traffic manager, will attend the meetings as presiding officer.

The present office of the department in the Ford Building, Detroit, will be discontinued, and larger quarters secured in the General Motors Building.

Ford Acquires Assembly Site in North Carolina

CHARLOTTE, N. C., Nov. 11—Negotiations for a site on which the Ford Motor Co. will erect an assembling plant were closed today, 75 acres being purchased for $75,000.

The new building will be 300 x 800 ft. in dimensions and have a capacity of 400 cars a day. Work will be started on the construction of the plant at once.

Plans also call for the erection of a building for the manufacture of parts.

Program Completed for Service Meeting

Several Additions Made to List of Speakers—Factory Visits Arranged

NEW YORK, Nov. 14—Several additions have been made to the program of the joint service meeting of the National Automobile Chamber of Commerce and the Society of Automotive Engineers to be held at the Engineers Club, Dayton, Ohio, Nov. 20 and 21.

The complete program follows:

TUESDAY MORNING, NOV. 20

Address—C. F. Kettering.

Report of Service Committee.

(A) N.A.C.C. Service Division Platform.
(B) Secretary's Report.
(C) Special Reports.
(D) Announcements.

"Evils of Head Lamp Dimming and Instructions on Regulations"—R. E. Carlson, United States Bureau of Standards.

TUESDAY AFTERNOON

"What Lessons of Value to the Engineer Has the Flat Rate System Developed"—Don T. Hastings, Williams & Hastings, Inc., Detroit.

"How the Engineer Can Cooperate to Make the Flat Rate More Successful"—J. Willard Lord, president, Automotive Service Association of New York.

"Providing the Engineer with Service Data to Improve Design"—O. T. Kreusser, coordinating engineer, General Motors Research Corp.

WEDNESDAY MORNING, NOV. 21

"The Evils of Crank Case Dilution—How to Educate the Public"—E. F. Hallock, manager, Manufacturers Division, Vacuum Oil Co.

"What Can the Engineer Do to Help the Public"—T. A. Waerner, engineer, Tide Water Oil Co.

"Selling Service"—W. L. Wise, service manager, National Cash Register Co.

WEDNESDAY AFTERNOON

"What Part Can the Engineer Play in Helping to Reduce Repair Costs by Eliminating the Need of Costly Tools"—W. A. Francis, manager, Ford Motor Co., Cincinnati.

"Electrical Repair Problems as Encountered by the Garage Repairman"—P. J. Durham, secretary, Automotive Electric Service Association.

"What Can the Engineer Do to Simplify Electrical Repair"—J. C. Halbleib, North East Electric Co.

Following the meeting, the Dayton committee has arranged visits for those persons who can stay over Thursday to McCook Field and the plants of the National Cash Register Co., General Motors Research Corp. and the Dayton Engineering Laboratories Co.

FORD OUTPUT IN OCTOBER

DETROIT, Nov. 14—Ford production for October was 185,924 cars and trucks, the largest month's output in domestic plants that the company has had. For the week ending Nov. 6 domestic car and truck production was 39,793.

Farmer Big Closed Car Buyer in South

His Purchasing Power Has Increased Greatly Due to Prices for Cotton

ATLANTA, Nov. 14 — An unprecedented demand for closed cars is reported by distributors in Atlanta, Birmingham, and other important automotive distributing centers of the South, dealers throughout the district asking for a considerably larger number of closed cars than the distributors are able to supply.

Of special note is the fact that the biggest demand is coming from dealers in the smaller towns and communities throughout the district, where there is promise of at least 100 per cent increase in closed car sales over last fall and winter, due to the increased buying power of farmers.

Cotton has climbed to a price of nearly 32 cents per pound at the principal southern spot markets, and the year's crop is being marketed at around these figures.

Total value of the southern crop is about $225,000,000 to $250,000,000 more than four or five weeks ago, and southern farmers are in a more prosperous condition than they have ever been before. This fact, smaller town dealers state, is accounting for the unprecedented demand for closed cars this fall. Marked betterment has been reported by distributors here among the dealers in both North and South Carolina, Georgia, Florida and Alabama, East Tennessee and Mississippi, except in the extreme southern sections of Alabama and Mississippi.

Records Broken in San Antonio

SAN ANTONIO, TEX., Nov. 15—The month of October broke all previous records for the sale of new cars in Bexar County San Antonio), Tex., when 1033 new cars were registered.

Not only was this the greatest month's business in the history of automobiles in this section of the State, but it also shows the improvement in business conditions in southwest Texas. High priced cotton and other good crops, combined with plenty of rain on the cattle ranges, have put considerable money in circulation and this is being reflected in the sale of new cars.

From Jan. 1 to Nov. 1 7000 new cars were registered in Bexar County, this being several hundred greater than the number registered during the entire year of 1922.

While a little more than half of the registrations during October were Fords, there was a greater percentage of higher priced cars sold than in several months previous.

Heavy Demand in North Carolina

CHARLOTTE, N. C. Nov. 10—Charlotte automobile distributors report the heaviest demand for closed cars they have ever had. Formerly the open car had the preference in this territory, but this season's sales and demand are giving the closed car the lead. The number of sales of closed cars particularly is limited only by the ability of the factories to supply the demand.

All the distributors report a good fall business and they are disposed to regard this as one of the best seasons they have experienced. There has as yet been no noticeable tendency toward a slowdown in buying because of the approach of the winter season. The continual extension of the mileage of hard surface roads is largely solving that problem for the dealer.

Given good roads there is very little weather in this section that would make the use of cars uncomfortable and practically none that would make their use impossible. This spreading of the network of good roads may also be largely responsible for the favorable reception now given to closed cars, for it permits cars to be used all winter.

Present Prospects Good for Sales in Argentine

BUENOS AIRES, ARGENTINA, Oct. 23 (*by mail*)—Present prospects for a successful selling season during the present spring and summer months are exceptionally bright. The reaction in the prices of beef cattle means that there will be a considerable sale of automobiles among cattle owners, who have been buying very few cars during the last three years.

Since the ranchmen as a body are the heaviest buyers of cars in the interior of the Republic, this improvement no doubt will have an important influence on the sales of the automobile importers this season. Likewise, bumper crops are confidently expected.

Rochester Railways Buy Buses as Line Feeders

ROCHESTER, N. Y., Nov. 13—Three gasoline and five electrically operated buses have been put in operation here by the New York State Railways as feeders to the regular trolley system of the company in this city. The Rochester Railways Co-ordinated Bus Lines, Inc., has been organized as a subsidiary of the New York State Railways to operate the buses.

The electric buses, or "trackless trolleys," are used as crosstown lines to feed the main trunk lines of the street car system. The gasoline buses are used as feeders in the outlying districts, connecting the city street car system with the outlying districts beyond the city limits.

Both the gasoline and electric buses are identical in construction. The chassis were built by the Brockway Motor Co., Cortland, N. Y., and the bodies by the Kuhlman Car Co., Cleveland. They have a seating capacity of 25, with standing room for 10. Entrance and exit is through a door at the front.

California Doubles Used Car Purchases

Prefers Automobile of High Price When New to Low Priced New Automobile

SAN FRANCISCO, Nov. 14—The used car problem seems to be solving itself in California this fall, or rather the buying public, which has not hitherto been called on for a solution, has furnished one without being asked.

Reports from all the cities and larger towns from the Oregon boundary to San Diego show that sales of used cars for October, 1923, were considerably more than twice as great as in the same month in 1922, and better than three times as great as those for September, this year.

Used motor trucks, both large and small, took the same sudden outburst of activity, and it is almost impossible to buy a used truck in good condition in any city in California north of the Tehachapi Mountains, which divide southern from northern California.

The used cars in greatest demand are those which can be bought for from $800 to $1,200 cash. The demand for used cars, priced when new at $1,250 to $3,500, has been proportionately far greater than the demand for new cars priced from $1,200 down.

Carry Large Amount of Paper

An official of the San Francisco Dealers Association estimates after several conferences with the dealers and with credit men in different lines in the city that, at the end of September, 1923, there was $112,500,000 owing to the dealers of California in deferred payments on automobiles. A very conservative estimate of the cost of upkeep on these cars is $100 a year, or $22,500,000, for the 225,000 cars so sold on deferred payments.

Compared with these figures on the automotive industry, this investigator found that at the end of September, 1923, there was $12,000,000 owing on deferred payments on musical instruments; $150,000,000 on furniture, and $275,000,000 on house contracts, not mortgaged, but being paid out by the month, a total of $437,000,000.

These figures, which are as accurate as can be obtained along these lines indicate that the automobile dealers of California are carrying on deferred payments more than one-fourth as much money—$112,500,000—as the dealers in musical instruments, the furniture houses, and the real estate owners and dealers, all combined.

URGE UNIFORM TRAFFIC LAWS

URBANA, ILL., Nov. 10—Uniform traffic regulations for Illinois cities of the same class and feasible solution of traffic problems were high points at the closing sessions of the Illinois Municipal League meeting here this week.

FINANCIAL NOTES

Continental Motors Corp., reports that during the fiscal year ended Oct. 31 shipments were 2 1/7 times more than the largest previous year. The aggregate sales values of shipments during the year were 50 per cent greater than the total sales of 1922 and exceeded any previous year with the exception of 1920. Earnings are estimated to have been slightly less than $2,000,000 compared with $1,469,940 for the fiscal year ended Oct. 31, 1922. Shipping schedules for November and December are reported to be 25 per cent greater than those for the same two months of last year.

Paige-Detroit Motor Car Co. has called a special meeting for Tuesday, Nov. 27, to take action on increasing the capital common stock from $4,000,000 to $8,000,000 par value $10. The present capital is $4,000,000 common, par value $10 and preferred $3,000,000. The company has paid a total of 12 per cent cash dividends this year and on Dec. 29, 1922, declared a 100 per cent stock dividend. It is reported that following the stockholders' meeting a 50 per cent stock dividend will be declared by the board of directors.

Spicer Manufacturing Co. reports net sales of $11,295,061 for the nine months ended Sept. 30, comparing with $7,580,337 for the same period last year. After payment of all expenses, interest and other charges net profits were $1,244,698, equal to $2.89 a share on the 313,750 shares of no par value common stock outstanding, against $2.58 a share in the same period last year.

Hayes Wheel Co. reports October gross business at $1,583,000, or nearly $200,000 greater than the best month in 1922 and $182,000 less than the best month in 1923. Gross business for the ten months ended Oct. 31 totaled $15,716,000, against $12,968,000 for the entire year of 1922.

Packard Motor Car Co. has declared the regular quarterly dividend of 1¾ per cent on the preferred stock, payable Dec. 15 to stock of record Nov. 30.

Michigan Drop Forge Co. has declared the regular monthly dividend of 25 cents a share on the common stock, payable Dec. 1 to stock of record Nov. 25.

Detroit Brass & Malleable Works has declared its regular monthly dividend of ½ of 1 per cent, payable Dec. 1 to stock of record Nov. 26.

Hupp Schedule for 1924 Calls for 50,000 Output

DETROIT, Nov. 15—Hupp Motor Car Corp. has fixed its production schedule for next year at 50,000 cars, an increase of 10,000 over the schedule this year, and will be prepared to deliver 75 per cent of its schedule in closed cars, should the demand require it.

These were part of the company's plans outlined to distributors at the annual factory meeting here this week. Distributors were urged to begin to stock cars for next spring trade now, open cars especially, so that the shortage experienced during the peak season of this year might not be experienced again.

The company was forced to cancel 7573 orders this year, Sales Manager O. C. Hutchinson said, because it was unable to make enough cars during the peak season to meet all demands.

With about 5000 more cars to be taken to complete its schedule of 40,000 for this year, Hutchinson said, there was no doubt but that this would be comfortably reached. To aid dealers during the remaining months of the year in making semi-custom and special paint sales, the factory is prepared to ship cars in the lead and to otherwise finish them according to individual requests.

Distributors were urged to give more attention to wholesale business as a means of reducing used car accumulations in cities. Much used car difficulty in cities was ascribed to distributors pushing sales at retail too heavily and not building up the wholesale business.

Employment Conditions Varied During October

WASHINGTON, Nov. 14 — Reports from field agents of the United States Employment Service show that employment was generally good in the automobile industry in Michigan during October. Decreases in the number of workers employed were reported from some localities in Indiana and Ohio.

The Michigan survey indicated that automobile tire and accessories plants in Grand Rapids, Lansing, Flint and Bay City were working overtime and in many instances were short of skilled help. Several large Detroit plants were likewise working overtime during October.

A temporary let-down in the automotive business was reported from Indianapolis. It was said that 1900 men were laid off at a South Bend automobile plant. A study of the employment situation in Ohio indicated that automobile production and the iron and steel output there were down about 17 per cent from the peak records of last spring.

Conditions in Cleveland

CLEVELAND, Nov. 14—Automobile factories in this city and those establishments engaged in making automobile accessories experienced another drop in their payrolls during October. This is disclosed in the monthly report of the Committee on Labor Relations of the Chamber of Commerce.

The automobile producers reduced their working forces 6.5 per cent during October, which, however, is regarded as the usual seasonal decline. In the city of Cleveland the total reduction in working forces in 100 plants that reported was 1.9 per cent, as compared with the closing day of September.

Proposed Governor Law Beaten in Cincinnati

CINCINNATI, Nov. 14—The Cincinnati Automobile Dealers' Association achieved a victory when the recent election returns showed the defeat of an ordinance which would have compelled the owner of each motor vehicle operating within the city limits to equip it with a speed governor.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

An improved tone was apparent in commodity markets last week, while stock quotations continued the upward movement begun the week before.

Cash cotton reached the year's high point at 34.50 cents a pound on Wednesday of last week, suffered a slight reaction, and advanced again to 34.25 on Monday.

Steel prices continued firm, while the decline in pig iron carried the *Iron Age* composite price to $22.27 the preceding week. The output of steel in October was estimated at 3,547,966 tons, as compared with 3,316,166 tons in September. Last month's production of pig iron was placed at 3,149,158 tons, as against 3,125,512 in September. Unfilled orders on the books of the United States Steel Corp. on Oct. 31 amounted to 4,672,825 tons, as compared with 5,035,750 on Sept. 30 and 6,902,287 on Oct. 31, 1922.

Car Loadings Increase

Car loadings during the week ended Oct. 27, numbered 1,073,965, compared with 1,072,881 in the week before and 999,027 in the corresponding week last year. Surplus freight cars on Oct. 31 totaled 24,477, or 582 more than a week earlier, while on the same date the reported shortage was 12,336 cars, a decline of 1319 for the week.

The value of building contracts awarded in October in thirty-six eastern States was $360,687,000, according to figures compiled by the F. W. Dodge Corp. This marks an increase of 25 per cent over the September total, as against a normal seasonal increase of 7 per cent.

The Fisher index of wholesale commodity prices was unchanged at 154 last week, comparing with 155 two weeks before and 156 in the week of Oct. 21. Bradstreet's food index stood at $3.35 as against $3.33 in the preceding week and $3.37 a year ago.

Bank debits to individual accounts reported by the Federal Reserve Board for the week ended Nov. 7 (a holiday week) amounted to $9,384,700,000, showing a gain of $38,904,000 from the preceding week, and an increase of $851,697,000, or about 10 per cent over the corresponding week last year.

Loans Show Gain

Loans of reporting member banks increased $23,000,000 during the week ended Oct. 31, loans secured by stocks and bonds showing a gain of $33,000,000 and "all other" loans a decline of $13,000,000. Investments increased $17,000,000 and net demand deposits $81,000,000. Reserve balances with Federal Reserve banks increased $37,000,000 and accommodation at Reserve banks $32,000,000.

Call money was firm at 5 per cent last week, easing off to 4½ on Monday. Time loan rates were 5 to 5¼ per cent, as compared with 5 per cent for all maturities in the preceding week.

Manufacturers Keep Sheet Supplies Low

Little Ordering Reported in Pittsburgh for First Quarter of Next Year

PITTSBURGH, Nov. 12—Buying of automobile sheets, as observed in this district, has become very light, and little is being done for the first quarter of next year. All reports received here are to the effect that stocks in the hands of consumers are low, in some cases subnormal. Inventories are being reduced to a minimum, as per custom, that large cash reserves may be on hand at the end of the year.

Sheet manufacturers insist the automobile men are wrong in their policies. The automobile men in turn insist that deliveries may be obtained promptly and that there is no possibility of advancing prices. Further, it is reported here that car makers, especially in the class that sells for below $700, are exceedingly chary about buying. They fear considerable competition next year and are seeking steel price concessions.

Expects Demand Soon

One large steel interest here is proceeding in its company policy of anticipating a large demand for sheets within three months, largely from the motor interests. This interest is going to stock all the available sheet bars it can secure from its producing interests so that it may have them on hand when the buying wave comes. In purchasing these sheet bars it is committing itself to the belief that their price will not go lower.

The Pittsburgh steel interests figure that, while automobile men declare their output has declined from the peak of midsummer, they are not taking sufficient cognizance of the fact that their September and October business was much better than the same period in former years. General consumption indicates good business may be expected next year. It has been figured that even if next year's business runs but 75 per cent of the total of this year, the automobile men have not made preparations for buying raw materials for anything near that figure.

One large Detroit manufacturer is said to have prepared a chart showing the inconsistency between the present steel prices and those now prevailing on pig iron, scrap and coke, and to have declared that it would not buy until the finished steel prices were more in line with those figures. The seller to whom the chart was shown pointed out that his costs were not computed on pig iron, scrap and coke.

ASK FOR TIRE RECEIVER

PHILADELPHIA, Nov. 15—A petition for receivers for the National Rubber Products Co. and the National Rubber Co. has been filed in the United States District Court by John T. Hill and Ephraim Lederer, receivers of the Hydro United Tire Co. of Pottstown, Pa. The companies are inter-related. The purpose of the petition is to secure title to the tire manufacturing plant held by the National Rubber Realty Co., an affiliated concern.

INDUSTRIAL NOTES

Gabriel Manufacturing Co. is building an addition to its plant in Cleveland which will increase the output of its snubbers one third. Daily output is now 2000 sets.

Harron, Rickard & McCone, Inc., have been appointed representatives of the Fellows Gear Shaper Co. of Springfield, Vermont.

Rainbow Tire & Rubber Co. expects to start operations in its new plant in Delaware, Ohio, as soon as the installation of machinery, now under way, is completed. The company specializes in Truss tires. Company headquarters are now maintained in Columbus.

U. T. Hungerford Brass & Copper Co. announces the opening of its new warehouse and store at 411-429 D Street, Boston. It embraces 45,000 sq. ft. of floor space with a total capacity in excess of 15,000,000 lbs. F. H. Barton is the Boston manager of the company.

Johnson Bronze Co., Newcastle, Pa., will build a large addition to its plant to house a department for making bushings under a new process. The new department will start with seventy-five workers employed.

Ladish Drop Forge Co. of Cudahy, Wis., due to an increase in the demand for its product has added a 300-foot extension to its forge shop. Many new pieces of equipment have been installed.

Master Products Co., Chicago, manufacturer and dealer in automobile accessories, has filed a voluntary petition in bankruptcy stating liabilities to be $48,467 and assets, $52,523.

2000 Ford Trucks Ordered by Japanese Government

WASHINGTON, Nov. 14—Information received here today shows that the Japanese Government has placed orders with the Ford Motor Co. for the delivery of 2000 motor trucks. The Government has also ordered several hundred trucks of various makes for use in the stricken area.

In addition, private organizations have placed business with American automotive manufacturers.

Because of the urgent need of transportation in the devastated areas, every effort has been made by shipping companies to expedite these deliveries from the west coast.

YELLOW CAB IN CHILE

WASHINGTON, Nov. 12—An executive decree by the Chilean Government authorizes the formation of a company in Santiago for the operation of the Yellow Cab service. The company consists of two partners, both Americans.

METAL MARKETS

Routine buying of steel products by the automotive industries continues in sufficient volume to leave prevailing quotations undisturbed. There is no disposition on the part of automotive consumers either to depress values or to anticipate their requirements sufficiently to impress producers with their extent and thus to quicken competition. Nominal reduction in the Pittsburgh and Youngstown districts of the price level for cold-finished steel bars by $5 a ton and the revision of pending contracts on Nov. 1 in accordance with this reduction, resulted not from pressure by buyers but solely because of a desire to equalize prices on the same basis as those which had been in effect in the Chicago market for some time.

Apparently the mills furnishing hot-rolled material to the cold-finished bar makers are not generally obtaining the $3 extra per ton promulgated some time ago for screw stock quality, else there would be only a margin of $9 per ton between the cold-finished bar price of 3 cents and the 2.40 cents for hot-rolled plus $3 per ton for screw stock quality, which would make it well-nigh impossible for the cold finishers to make both ends meet. Significant is the relative firmness of sheet bars at $42.50 when nearly all the other descriptions of semi-finished steel are pronouncedly easy. This tends to emphasize the industry's determination to maintain sheet prices on the present basis.

The leading independent producer in the Chicago district has followed the example of the Corporation's subsidiary in opening first quarter 1924 sheet order books on the basis of prevailing prices. Generally, however, not much debatable sheet business has been placed so far for 1924 shipments. The business that has been inscribed on the Corporation's books is of the character that would have come to it under any circumstances. While producers of full-finished automobile sheets appear to have on their books a sufficient quota of orders to keep them in operation over the remainder of the year at a fairly comfortable rate of production, some of the smaller independent sheet producers are reported to be feeling the pinch for more liberal specifications.

The market for alloy steels, while not spectacular, is by no means dormant. In fact, interest in automotive alloy steels is on the uptrend. Prices are held steady, and while tonnages ordered are not such as to attract attention, a more regular inquiry is in evidence.

Pig Iron.—In spite of the reduction of the number of furnaces in blast, the dent in output is not sufficient to offset the light demand. Many producers are piling up iron, and refuse to compete for business at the prevailing market prices which are generally said to be below cost of production. Automotive foundries are not buying heavily, apprehending apparently no early change in the situation.

Aluminum.—The somewhat greater consumption of aluminum in the construction of closed cars is responsible for a modest improvement in the immediate demand.

Copper.—Buying of copper and brass products by the automotive industries and the resulting broadening of domestic buying of ingot copper are held to have been largely responsible for the change that has come over the copper situation. Leading brass mills have advanced their prices for the first time in many months.

Calendar

SHOWS

Jan. 5-12 New York, Annual Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Eighth Coast Artillery Armory.

Jan. 26-Feb. 2—Chicago, Annual Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.

Jan. 26-Feb. 2—Chicago, Annual Automobile Salon, Hotel Drake.

Feb. 4-9—Chicago, Tenth Annual National Motorcycle, Bicycle and Accessory Show, Broadway Armory, under the auspices of the Motorcycle and Allied Trades Association, A. B. Coffman, secretary.

FOREIGN SHOWS

Nov. 22-Dec. 1—London, Motor Transport Exhibition.

Dec. 1-10 — Montevideo, Uruguay, Automobile Show, Buildings of the Rural Society.

Dec. 8-19—Brussels, Passenger Cars, Trucks, Airplanes and Motor Boats, Aviation Palace.

RACES

Nov. 29.—Los Angeles.

CONVENTIONS

Nov. 20-21—Dayton, Ohio, Factory Service Managers' Meeting of the National Automobile Chamber of Commerce in cooperation with the Society of Automotive Engineers.

Nov. 21—Detroit, Annual Meeting of Motor Truck Industries, Detroit Athletic Club.

Jan. 5—New York City, Annual Meeting, Automotive Electric Association.

Jan. 14-18 — Chicago, Annual Convention and Show of the American Road Builders' Association, the former to be held in the Congress and the latter in the Coliseum.

May, 1924—Detroit, International Motor Transport Congress under the auspices of the National Automobile Chamber of Commerce

S. A. E. MEETINGS

Nov. 19—Cleveland Section, Engineering Aspect of the Used Car, David Beecroft, Cleveland Hotel, Cleveland, 7.30 p.m., Dinner, 6.30 p.m.

Dec. 13—Metropolitan Section, Vehicles for Package Delivery.

Jan. 22-25—Annual Meeting of the S. A. E.—Detroit.

Feb. 14 — Metropolitan Section, Vehicle Depreciation.

March 13—Metropolitan Section, Replacement Parts and Accessories.

April 17—Metropolitan Section, Fleet Maintenance, F. W. Winchester.

May 15 — Metropolitan Section, What Roads and Steels Do to Automobiles.

Fox Working on Plan for Reorganization

(*Continued from page* 1020)

velopment Co., 5000 such shares being subsequently turned back into the treasury of the Fox Motor Car Co. and used by it as a bonus on the sale of the first preferred stock.

The Class B common stock has been used to the extent of the amount issued as a bonus on the sale of the preferred stock, gold notes and first mortgage bonds. The total amount outstanding of the preferred stock of the corporation is 20,767 shares, of the value of about $2,076,620.

The total amount of the common stock, Class A, outstanding is 20,000 shares without par value. The total amount of Class B common stock outstanding is 10,000 shares of no par value, of which 6036 shares have been issued. The Class B common stock of no par value is carried on the books of the company at a total value of $301; and 9234 shares of the preferred stock, to the value of $23,379 still remain in the treasury of the corporation; and 3964 shares of Class B common stock of no par value are still in the treasury.

Authorized Bond Issue

The corporation has authorized an issue of $500,000 of 8 per cent gold notes, dated Nov. 1, 1922, and due Nov. 1, 1927, of which $136,403 has been issued.

The corporation also has authorized an issue of $1,000,000 first mortgage 7 per cent sinking fund gold bonds, dated June 30, 1923, and due July 1, 1938, of which $94,075 has been subscribed for, when, if and as issued.

The factory building, 60 x 400 ft., is owned by the company, as are considerable machinery and an inventory of finished automobiles, cars in process of assembly, engines, finished and in process of assembly; patents, blue prints, engineering data and other personal property.

It has on hand, according to a statement, a large amount of Fox air-cooled cars, some of which are new and others of which have been used at various times for demonstrating and experimental purposes, and a large number of cars in process of manufacture, together with materials, raw, manufactured and in process of manufacture; also a large amount of valuable contracts with dealers and distributors of motor cars for the sale and distribution of Fox air-cooled cars.

The assets consist of the foregoing and cash, accounts receivable, real estate, machinery and equipment, all valued, according to statement, at about $2.228,940.

The total liabilities are for accounts payable, notes payable, secured, unsecured; accrued salaries and wages; accrued interest and compensation insurance; deposits from dealers on car purchase contracts; 5-year gold notes, first mortgage on real estate, first mortgage bonds, and bond subscriptions received for which the bonds have not yet been issued, aggregating $450,907.

The greater portion of the liabilities consisting of accounts payable, notes payable, accrued salaries and wages and interest, and the mortgage on real estate total about $213,000, are now either due or about due. Several creditors are said to have threatened suits and attachment proceedings, both in and outside Pennsylvania.

E. J. Lafferty, secretary-treasurer of the E. A. Wright Co., was a signer for the petitioning creditor company Walter J. Rice, secretary of the Fox Motor Car Co, admits the allegations made by the petitioning creditors.

Chicago Interests Get St. Louis Bus System

CHICAGO, Nov. 14—Chicago interests, closely associated with the Yellow Cab companies, will take over and operate the motor bus system in St. Louis. A holding company has been organized, capitalized at 70,000 shares of stock. This company will buy out the People's Motorbus Co. in St. Louis.

The Chicago Motor Coach Corp. will have a large interest in the holding company. An order for 100 buses has been given the Yellow Coach Manufacturing Co.

Gasoline Prices Drop Nearer Level of 1914

NEW YORK, Nov. 13—Prices of gasoline in New York, New Jersey and other Eastern States were reduced one cent a gallon yesterday, the reduction bringing the wholesale price to 15 cents and the retail price to 18 cents. This is a drop of 8 cents a gallon from the wholesale price quoted in New York State on Jan. 1 and is the lowest price quoted since September, 1915.

In 1914, just after the outbreak of the war, prices were 12 cents wholesale, and in 1920 rose to 31 cents, or double the current price.

The present reduction was first made by the Gulf Refining Co., and this action was followed immediately by the Standard Oil Co. of New York, the Standard Oil Co. of New Jersey and many independent companies operating in competition with the Gulf and Standard Oil organizations. Predictions have been made that gasoline prices may be reduced further during the winter, and it would not be surprising, some leaders do declare, if the retail prices drop to 15 cents per gallon, or 3 cents below the current price.

Lower Prices in Baltimore

BALTIMORE, MD., Nov. 14—Another reduction of 1 cent has been announced on the price of gasoline in this city, bringing the price down to 19 cents.

Drop in Chicago

CHICAGO, Nov. 10—Gasoline was selling at 14 cents a gallon in Chicago today, a drop of two cents from the price which has been in effect for several weeks.

NASH REPORTS BEST MONTH

KENOSHA, WIS., Nov. 14—October was the biggest month in the history of Nash Motors Co., sales showing a 10 per cent increase over the same month last year. Actual figures were 4245 passenger cars shipped last month as against 3628 in October, 1922.